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Local Landscapes of Pastoral Nomads in Southeastern Turkey

ABSTRACT

The important historical role of pastoral nomads in Mesopotamia stands in stark contrast to the dearth of archaeological data on pastoral nomadic groups of any pre-modern period. Archaeological models neglect not just a significant segment of past populations; they also lack data on a substantial portion of the past food and textile production systems. Historical records and excavation have demonstrated that the resilience of Mesopotamian economy depended in part on pastoralism, but archaeologists know very little about the long-term management of the pastoral landscapes beyond core agricultural areas.

This study examines empirical evidence for pastoral nomadic modes of inhabiting and transforming the landscape over the last 500 years in the upland fringes of the Upper Tigris River Valley in southeastern Turkey. Four seasons of archaeological survey mapped diachronic patterns in pastoral nomadic winter land-use, including patterns of campsites and spatially associated landscape features such as cisterns, corrals, caves, cairns, and check dams. Ethnographic and historical data as well as satellite imagery aided in archaeological interpretation.

Three main conclusions about pastoral nomads are drawn from the characteristics and spatial distributions of the surveyed features. 1) Pastoral nomads altered their local landscapes for the purposes of sheltering humans and animals, collecting water, and improving pastures. Areas surrounding campsites contained abundant evidence of landscape management and capital investments in the herding potential of the area. 2) These investments were fixed, re-usable, and encouraged seasonal re-inhabitation of certain areas. Over time, these features became

“landscape anchors”—geographic foci that structured the spatial organization of local landscapes.

3) The topographical position of domestic and herding features would have resulted in vertical daily movement patterns for humans and animals.

These results force a reassessment of widely-held assumptions about the invisibility of campsites and the role of pastoral nomads in the transformation of Near Eastern landscapes.

Although limited in time and space, this study presents grounds for optimism for a robust landscape archaeology of pastoral nomads. Intensive surveys, targeted excavations, and radiometric dating programs have enormous potential to provide more complex diachronic understandings of pastoral nomadic land-use strategies, sustainability, quotidian movement, and senses of place.

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CHAPTER 1: PASTORAL NOMADISM AND PASTORAL NOMADIC LANDSCAPES IN NEAR EASTERN ARCHAEOLOGY

Introduction

For approximately 9000 years, Near Eastern economy and society consisted of groups existing along a continuum between fully sedentary agricultural lifestyles and pastoral nomadic lifestyles involving long-distance transhumance. To date, Mesopotamian archaeologists have collected data almost exclusively on the sedentary sector of ancient societies with economies based primarily on agriculture. As a result pastoral nomads are typically incorporated into archaeological models solely through biased historical accounts written by urban elites and analogies to twentieth century ethnographic observations. This approach has resulted in a limited understanding of the historical roles of pastoral nomads in Near Eastern society, little recognition of change and individual agency in pre-modern pastoral nomadic land-use, and little knowledge of how pastoral nomads transformed the landscape or how they organized or conceived of the territories in which they lived and moved.

This study attempts to address such biases and problems by reconstructing winter pastoral nomadic land-use patterns of the last 500 years on the upland edges of the Upper Tigris River Plain in southeastern Turkey. Previous archaeological, ethnographic, and historical work has either approached pastoral nomadism through a broad regional perspective focused on annual transhumance cycles or through small-scale studies of the internal arrangement of individual campsites of a particular season. The archaeological study presented here provides a picture of the missing “middle” scale, that is, the local landscape organization most directly relating to daily movement patterns and seasonal land-use within particular environments.

In the study region in southeastern Turkey, pastoral nomads cumulatively created a subtle but pervasive cultural landscape designed to increase the herding potential of the local area. Over

four field seasons, the Hirbemerdon Tepe Survey documented campsites and suites of spatially associated landscape features, including corrals, cisterns, caves, cairns, and check dams. The distributions of these sites and features were used to examine seasonal inhabitation patterns, daily herding patterns, water accessibility, and the factors that shape them. The archaeological results indicate that pastoral nomads altered their local landscape for the purposes of sheltering humans and animals, collecting water, and improving pasture. An integration of archaeological and ethnographic data suggest that the spatial organization of pastoral activities over time were shaped by the locations of “landscape anchors”—permanent features that enhanced natural resources, marked territory, and expressed a sense of place.

By examining pastoral nomads as agents positioning themselves in and modifying the landscape, this study counters sedentary-centric ethnographic and archaeological models of pastoral nomadic land use as ephemeral, as archaeologically undetectable, and as a static filler of marginal landscapes beyond the boundaries of agriculture. The synthesis of archaeological, ethnographic, and historic data on local landscape organization provides an entry point for reconstructing the history of pastoral nomads on their own terms, and for considering pastoral nomadism as a strategy with its own distinct set of options, potentialities, and constraints.

Before delving into the details of geography, environment, methodology, and data, it is necessary to outline some central concepts and definitions regarding pastoral nomadism and the landscapes and archaeology of pastoral nomads. This introductory chapter begins with definitions of pastoral nomadism, an explanation of the role of pastoral nomadism in ancient and pre-modern Near Eastern society, and a discussion of various spatio-temporal dimensions of pastoral mobility and land-use. Landscape anchors enhanced natural resources over long periods of time and may have shaped pastoral movement, inhabitation patterns, and daily activities. A review of recent archaeological work on pastoral nomadism in the Near East shows that archaeologists have generally neglected to collect data at the local landscape scale that is necessary for recording such landscape anchors, documenting their environmental impacts, and

analyzing the effect that they had on pastoral nomadic land-use strategies. Recovering local landscapes of pastoral nomads in the Near East requires intensive archaeological survey in upland areas outside of the boundaries of modern-day agriculture. The goal of this research is to demonstrate the effectiveness of one intensive survey in identifying the organization, function, and effects of landscape anchors within a pastoral nomadic landscape of the last 500 years in southeastern Turkey.

Definitions of Pastoral Nomadism

Pastoral nomadism revolves around the movement of domesticated animals between areas with seasonally abundant grazing land. The term “pastoral nomadism” involves two interlinked but independently varying dimensions. Nomadism involves the transhumant migrations of livestock and human populations, allowing both for the seasonal exploitation of pastures and for fluidity in residential associations. Pastoralism involves human dependence on domesticated animals for subsistence (Barfield 1993: 4; Khazanov 1984: 15-16; Salzman 1971a).

Historians going back to Ibn Khaldūn ([1377] 2005: 91-93) and present-day archaeologists have often conceived of Middle Eastern economy and society in terms of a pastoral nomad and sedentary agricultural dichotomy. This idea has been perpetuated by a number of factors, including ancient texts, Orientalist literature, modern archaeological practice, analogical reasoning, and simplifying historiographies (Bernbeck 2008: 45). Such a dichotomy does not explain variability in individual case studies: even the most sedentary agricultural villagers often keep animals, and many pastoral nomadic groups are known ethnographically to practice some degree of agriculture.

For the purposes of describing behavioral variability and rural economy, it is much more productive to view pastoral nomadism in terms of two continua: nomadism-sedentism and pastoralism-agriculture. Placement on these continua proceeds according to the degree of

reliance on animals as opposed to other modes of subsistence and according to the degree of mobility practiced by a group of people. If these continua are placed on the axes of a probability space, populations show a general linear correlation between the degree of pastoralism and the degree of nomadism (Cribb 1991b: 15-20). There is a considerable amount of variation in the degree of involvement with agriculture and degree of mobility among ethnographically-studied groups in the Middle East. For example, agriculture played a minor role in the Basseri economy and tents changed campsites as many as 120 times per year (Barth 1964: 9, 15); on the other hand, agriculture played a much more prominent role in Lur economy and tents changed campsites only around 30 times per year (Black-Michaud 1986: 2-3).

The integration of pastoral nomadism and agriculture can occur at a number of different social scales (Cribb 1991b: 23-27). Both subsistence strategies can be integrated into the annual schedule of a household itself, evidenced by pastoral nomad families who plant crops in their summer pastures and agricultural households in mountainous areas practicing short-distance summer transhumance. Both subsistence strategies can be integrated at the level of the community, as when communities partition themselves into specialized agricultural and pastoral nomadic sectors (Marsden 1976: 15; Tapper 1977) or when entire communities shift between agricultural and pastoral activities (Edelberg 1966-1967; Swidler 1973; Watson 1979: chapter 8). Integration can also occur at higher levels, as with integrated tribes of agricultural and pastoral nomad subsections (Barth 1953; Fernea 1970: 11-12; Rowton 1973), and dimorphic chiefdoms or dimorphic states (Rowton 1973; 1974; 1977). It is only when agriculture and pastoralism are pursued separately at a supracommunity level that whole communities migrate and are free to shift migration paths/routes (Cribb 1991b: 27).

Pastoral nomadic groups are organized spatially by camping and herding groups. A single household is the unit at which wealth in animals is independently held and is the unit of labor and ownership (Cribb 1991b: 34). The household is spatially equivalent to a single tent. A number of tents will join together to form residence and labor groups. Only during a restricted

phase of its development, when adolescent children are available to herd, is a tent self-sufficient in terms of labor. For this reason, groups of tents form herding units for the purposes of exchanging labor and jointly pasturing livestock (Cribb 1991b: 38). Camping groups consist of the tents that reside together for the purposes of labor exchange (Swidler 1972), defense (Tapper 1979a: 106), pasture acquisition (Bates 1973: 122-124), and/or sociability (Cribb 1991b: 143-146) and may include one or more herding units.

A distinction should be made between horizontal and vertical transhumance patterns (e.g., Barfield 1993: 7-8; Hütteroth 1959; Johnson 1969). Horizontal transhumance occurs between winter and summer pastures that are at the same general elevation. Vertical transhumance occurs between winter and summer pastures that are at substantially different elevations. The terms divide transhumant pastoralists according to both their environmental and social situations. Vertical transhumance occurs in mountainous areas for the purposes of taking advantage of altitudinal differences in the seasonal availability of pasture and water, typically with highland areas being used in summer and lowland areas being used in winter. Vertically transhumant pastoralists' use of lowland areas brought them into regular contact with sedentary farmers, with whom the transhumant pastoralists were interdependent economically (e.g., Bates 1971). Horizontally transhumance typically takes place in steppe and desert environments for the purposes of exploiting areas that have seasonally abundant pasture and water (e.g., Cole 1975). Horizontally transhumant pastoralists' interactions with sedentary farmers are less generalizable, although the desert camel nomads of Arabia (Bedouin) were frequently able to maintain more political and social autonomy from sedentary societies than mountain-based nomads (Rowton 1974: 4). In some cases, intermediate forms may exist. Some steppe nomads in Syria made use of low hill ranges that received seasonal precipitation and were historically well integrated with sedentary societies (Rowton 1974: 6).

The degrees of interaction and dependence as well as the power relationships between mobile pastoral and sedentary agricultural societies have been described in two archaeological

models of “enclosed nomadism” and “enclosing nomadism.” In the 1970s it was proposed that the primary historical distinction should be made between so-called enclosed nomadism, that is, pastoral nomads that were integrated spatially and socio-politically with sedentary societies, and more socio-politically isolated Bedouin nomadism enabled by the camel. Steppe and mountain nomads of Mesopotamia and Syria were spatially and socio-politically enclosed within areas dominated by urban settlements and agrarian states (Rowton 1974: 6-7). A recent archaeological analysis of early pastoralism and state-level societies in southwestern Iran argues for the reverse situation: from the fifth to the third millennia BC, spatial and sociopolitical spheres dominated by mobile highland pastoral groups enclosed sedentary farming communities of the lowlands. This model of enclosing nomadism sees highland pastoral nomadic zones (rather than lowland agricultural areas) as the “core” area in terms of political hierarchy (Alizadeh 2010: 353-354).

The archaeological features examined in this study relate to vertically transhumant pastoralists whose spatial and social relationships with sedentary societies have shifted over the last millennium. As Chapter 4 argues, medieval polities controlling the Upper Tigris area of southeastern Turkey drew their power and political hierarchy from pastoral nomadic tribes using highland and lowland pasture in the Taurus Mountains and Mesopotamian Plains. From at least the ninth century until the beginning of the sixteenth century, sedentary farming communities and cities were frequently islands within a much broader pastoral nomadic milieu. This situation most closely follows the enclosing nomadism model. Since the sixteenth century, the Ottoman and Turkish states have increasingly enclosed vertically transhumant pastoralists in southeastern Turkey by expanding agriculture and permanently settling pastoral tribes, reducing pastoral them to an increasingly smaller, less powerful proportion of the population.

The Significance of Pastoral Nomads in Ancient and Pre-modern Near Eastern Societies

Pastoral nomadic groups were important in ancient and pre-modern Near Eastern societies for a variety of reasons. The context in which pastoral nomadic groups are most frequently recognized as being important agents in Near Eastern history is their frequent conflict with states and empires. Where pastoral nomads such as the Gutians, Amorites, and Arameans appear in texts, they are often engaged in raiding sedentary polities and are portrayed as agents threatening “civilization” (Pongratz-Leisten 2001). It is in this role as hostile “Others” that pastoral nomadic groups are typically seen as significant in the social and political development of Near Eastern societies.

Historical texts and ethnographic analogy also lead to the conclusion that pastoral nomads must have been economically significant in Near Eastern societies. Pastoral groups supplied sedentary societies with milk, meat, and wool and trained for grain. Recent analyses of the dynamics and settlement patterns of many periods, including the Uruk Expansion (Algaze 2005; Kouchoukos 1998: 252-314) and the Old Assyrian Empire (Lassen 2010) focus on the importance of the wool trade, of which pastoral nomads were certainly a part.

Pastoral nomads were not separate spatially or socially from sedentary populations. Pastoralism and agriculture could be integrated at a variety of social and temporal scales. Their practitioners exploited overlapping zones and formed mutually dependent relationships to fulfill food, textile, and foddering requirements. This “two part existence” is expressed in cuneiform texts of the early second millennium BC through the Akkadian terminology of *hana* (“tent dweller”) and *nawum* (“steppe”) on one hand and *alum* (“town”) on the other (Fleming 2004). Further, in many historical situations, we know from texts that mobile pastoralists and sedentary agriculturalists were integrated into the same social and political structures.

Finally, pastoral nomadism was an important part of the flexibility in pre-modern subsistence strategies. Sometimes sedentary agricultural groups became pastoral nomads and

vice versa. Pastoral nomadism served as a means of risk management in the ancient and pre-modern Near Eastern economy, providing an alternative strategy for food production when environmental or sociopolitical factors made sedentary agriculture difficult (Adams 1978). Because animals could be grazed on land beyond the boundaries of cultivated fields and produced food (meat and milk) at times outside of the agricultural harvest, pastoralism represented a significant spatial and temporal diversification approach for populations within a given region (Marston 2011: 191-194). Mobility allowed herders to intensify production by seeking out the best pasture and water sources available at a given time within a given year. Within pastoral nomad communities, flexible camping (residence) and herding (production) groupings are another mechanism for diversification and flexibility. The flexible composition of pastoral nomadic camping and herding groups according to changing territory, pasture, and water conditions as well as the ability of agropastoral societies to change the amount of investment in pastoral versus agricultural production according to variation in climate are important factors explaining continuity and change in ancient Middle Eastern societies. The longevity of ancient settlement in certain areas of the Near East may have been enabled by networks of relationships that secured options for groups to switch from sedentary agricultural to mobile pastoral lifestyles.

All of these points converge in one particular historical example. One of the few in-depth textual records of pastoral nomadic groups comes from the cuneiform archives dating to the eighteenth century BC at the site of Mari, modern Tell Hariri, in eastern Syria (Fleming 2004). Mari was ruled by kings whose power rested on a base of sedentary agriculturalists, semi-sedentary pastoralists, and nomads organized according to traditional tribal structures. Mobile pastoralists were integrated into the same social and political structures as townspeople. King Zimrilim himself was an Amorite (a member of the Sim'alite tribal confederacy, one of two that he ruled), claimed to rule a "land of the Hana (tent-dwellers)," and appears to have functioned as a pastoralist overlord who was capable of drawing on certain groups for their resources, labor, and military skills. Recent surveys of the area to the north of Mari have found many ephemeral

occupations during this period (Lyonnet 2000; Ur and Wilkinson 2008; Wilkinson 2002). The Mari texts indicate that this may have served as the summer pasture for Sim'alite pastoralists. Although these "trace" settlements have not been excavated, their presence suggests that the western Khabur basin could have been open pastureland at this time (Ur 2010: 159-160). Since the texts provide so much information on political relationships with pastoral nomads, we may assume that Mari, located in an agriculturally marginal zone, relied heavily on pastoral products originating from the surrounding steppe for survival. Some archaeological reconstructions of earlier periods of occupation in Mari's environs and the Upper Khabur in the third millennium BC also suggest the importance of pastoralist production (Hole 1999; 2003; Lyonnet 1997).

Invisible Pastoral Nomads?

Despite their importance, pastoral nomads have been poorly studied archaeologically, for three primary reasons. Sites related to mobile pastoralism are ephemeral and difficult to locate when they survive. Perhaps more critically, the agriculturally marginal areas outside of alluvial plains in which they spent a significant part of their annual cycle and in which surface indications of their ephemeral sites are most likely to preserve have not been the focus of archaeological research. Further, sites related to mobile pastoralism are frequently difficult to date. Instead of heavy ceramic vessels, pastoral nomads have often used containers of lighter, more ephemeral materials that do not survive in the archaeological record. They tend to carry small numbers of belongings on migrations, and their campsites are often inhabited for short periods of time. All of these factors result in a situation where archaeologists using traditional techniques are unlikely to have access to substantial, chronologically-sensitive material assemblages.

In the absence of archaeological and historical information, archaeologists have frequently removed mobile pastoral groups from time and space by assuming them to be uniformly analogous to groups studied ethnographically in the 20th century. This approach

obscures historical change in pastoral nomadic society and land-use. Anthropologists frequently make the point that pastoral mobility was an important adaptation in semi-arid and arid landscapes. Mobility allowed pastoral groups to adjust their location and residential groupings according to available resources in time and space. However, the fact that we do not have any idea about historically specific pastoral land-use practices prevents us from identifying what sort of strategies and landscape investments made this adaptation possible.

To borrow a phrase from the title of a seminal book in anthropology, pastoral nomads in the Middle East have been rendered “people without history” (Wolf 1982) because their actions and activities are always viewed through the lens of the history of agricultural societies and ethnographic analogy. The “silence” of pastoral nomadic history (*sensu* Trouillot 1995) has been created by a number of factors in the history of archaeological scholarship. Such factors include the role of archaeology in the construction of museums, the privileging of deeply stratified tells for excavation, evolutionary theories linking agriculture with progress and sociopolitical complexity, and our own materialism in the modern world. Mobile and non-agricultural groups are frequently automatically associated with tribalism, a lack of archaeologically visible material culture, and a relative lack of change and progress (Porter 2012 (*in press*)). This perception of a lack of change and progress is heightened by the association of mobile groups with peripheral or marginal landscapes that are less modified and less productive than agricultural landscapes.

By examining the organization of the local landscapes surrounding short-term inhabitation sites, archaeologists have an opportunity to gain a window into mobile peoples’ history, daily activities, and senses of place, as well as an opportunity to analyze trends in the productive use and transformation of pastoral and so-called peripheral landscapes.

Pastoral Nomadic Landscapes and Dimensions of Pastoral Mobility

Vertically transhumant pastoralists use their landscapes in patterned ways in reaction to sociopolitical and ecological conditions. These patterns, which are more fully explored in Chapter 2, are imprinted on the landscape at multiple scales. As a result, it can be difficult to determine an appropriate spatial unit of analysis when studying mobile societies (Frachetti 2006: 130). When studying sedentary agricultural societies, archaeologists assume the “settlement” to be the basic unit of analysis. Landscape-oriented archaeologists study the “hinterlands” or “catchment areas” of these settlements/sites, as well as the landscape features that might fall outside of these hinterlands or catchment areas in the broader landscape. This progression from the site to the landscape does not necessarily transfer to mobile societies, whose land-use patterns are often more dynamic and variable. Even within a single environmental zone during the course of a single season, pastoral nomads may change their settlement location, shifting the location and characteristics of their hinterlands. During certain parts of the year, herds do not have to be kept in the immediate vicinity of the campsite, and thus the campsite’s herding catchment does not have to be centered around the campsite itself. Further, some of the most important activities of mobile societies take place across very broad expanses of territory yet are oriented by highly local environmental and landscape conditions.

In the field of human ecology, there has been an explicit recognition of various scales of movement and spatial investigations of pastoral land-use (e.g., Coppolillo 2000: 528), but this recognition has not structured ethnographic or archaeological studies. As Chapters 2 and 3 and the next section will demonstrate, ethnographic and historic studies have tended to focus their attention on one of three specific scales of pastoral nomadic movement and land-use. Studies have frequently focused on the political region, and in particular on the pressures that sedentary societies have placed on pastoral nomadic societies. Background descriptions of pastoral nomads

consider the ecological regions in which regional transhumance cycles took place. Finally, many studies have focused on the intra-campsite organization of tents and activity areas.

The “middle” scale of land-use between the two extremes of the broad regional and intra-site scales has been largely neglected by archaeological, ethnographic, and historical studies. This “local landscape” scale, more fully described in Chapter 2, involves the natural and man-made landscapes of resources and settlement immediately surrounding a campsite, including not only the locations of resources and settlement, but also patterns of movement and perception relating to resource use and interaction with surrounding communities. The examination of local landscapes in this study seeks examines households and herding collectives in space. The landscape immediately surrounding a campsite is the spatial scale at which these social units operate within a single season.

An interdisciplinary approach is necessary in the study of pastoral nomadic landscapes because different datasets will tend to provide information about different scales and dimensions of pastoral mobility and land-use. Historical texts, typically written from the perspective of sedentary societies, almost always speak exclusively to the broad regional scales, both political and ecological. Ethnographers could theoretically investigate any spatiotemporal scale of land-use, but as Chapter 2 will demonstrate, most have focused on the broad regional or intra-campsite/household scales, with only some tangential descriptions of the local landscape scale. Ethnoarchaeology has focused on the household scale through analysis of the internal organization of tentspaces and campsites. Excavations have occasionally also investigated the interior organization of campsites. Landscape archaeology is best positioned to directly investigate the local landscape scale.

Landscape Anchors

Archaeologists often implicitly assume that mobile societies did not transform their landscapes in lasting, archaeologically visible ways, or that they only transformed their landscapes in negative ways through overgrazing. They assume that pastoral nomads existed in times and places for which there is little evidence for sedentary land-use. For example, regional surveys of the Mesopotamian plains concluded that populations turned to mobile pastoralism during periods of demographic decline (e.g., Adams 1978; Adams 1981). Regional landscape models regulate both mobile and sedentary pastoralists to various unmodified “empty” spaces devoid of evidence for long-term permanent settlement (Porter 2012 (in press)). In southern Mesopotamia, mobile pastoralism is assumed to have taken place outside of the alluvial plains because settlements on these plains were proximate to each other and the space between them was filled with irrigated fields. In northern Mesopotamia, settlement-based pastoralism is assumed to have wound around cities that were spread more thinly across the landscape—herders roamed the broad empty areas between the agricultural hinterlands of major mounded tell sites (Wilkinson 1994; 2000).

In the context of modern and recent environmental history, the point is frequently made that herds destructively transform landscapes through overgrazing (Goudie 1990: 53-54; Jameson, et al. 1994: 325; Thirgood 1981; van Andel, et al. 1997: 54-55; Vita-Finzi 1969); rarely is the influence of pastoral communities in the non-destructive or beneficial transformation of the landscape addressed in either the past or present. The overgrazing narrative places agency with herds rather than people. It is ultimately the pastoralists’ animals, not the pastoralists themselves, who impact rural landscapes. The idea of environmental change driven by overgrazing has been seriously challenged in the Mediterranean (Forbes 2000) and Africa (Homewood and Rodgers 1984). One of the lingering assumptions behind the overgrazing narrative—that pastoralists frequently neglect and mismanage land—also removes agency from pastoral groups by failing to

consider conservation principles that may be built into herding strategies as well as the detailed yet expansive landscape knowledge of pastoralists.

What might shape the landscapes of pastoral nomads in productive ways at various spatio-temporal scales? We might begin to answer this question by considering the forces behind the formation of the agricultural and urban landscapes that have been so well studied in the Middle East. These zones were shaped by irrigation systems (e.g., Adams 1981) and track networks (e.g., Ur 2010) that resulted in the engineering of the landscape over long periods of time.

In other areas of the world, such features have been termed “landscape capital” and their effects resulted in the “historical path dependence” of subsequent development. Both concepts begin with the well-established idea that urban and agricultural landscapes are patterned built environments, cumulatively modified by generations of inhabitants who have transformed the environment and imposed physical structures on the land (e.g., Denevan 2001; Doolittle 2000; Whitmore and Turner 2001).

The concept of “path dependence” refers to the importance of initial conditions in structuring subsequent processes and has been studied primarily in the fields of economics, political science, and history of science (e.g., Liebowitz and Margolis 1995; Page 2006; Puffert 2004). In history and archaeology, the concept has been used to explore historical factors that have affected the location of industry (Arthur 1988) and the long-term effects of road networks connecting long-term sedentary settlements (McGlade 1999: 476-478). Once established, a road network acts as an attractor for future development and influences subsequent settlement. The concept of path dependence could be used to describe the long-term role of other types of features. Where natural resources have been significantly improved through the investment of significant amounts of labor and materials, these improvements could orient the location and structure the characteristics of future inhabitation or use events.

Landscape capital was originally defined as intensification efforts that “once created [persist] with the need only of maintenance” (Brookfield 1984), but later more strictly as “any investment in land with an anticipated life well beyond that of the present crop, or crop cycle” (Blaikie and Brookfield 1987: 9). These investments included skills, technology and labor (Brookfield 2001: 55). The concept of landscape capital developed in the context of agricultural economics (Sen 1968) and environmental history (Blaikie and Brookfield 1987; Brookfield 2001: 54-55) and has mostly been applied in cultural ecology (Widgren 2007). It has recently been applied to the describe the construction, use, and impacts of archaeological irrigation systems and road networks (Erickson and Walker 2009). In historical and archaeological discussions of the concept, there seem to be three main distinguishing characteristics of landscape capital. First, landscape capital contributes to environmental engineering, either over short periods through concentrated labor investment (i.e., a single major construction event) or through long-term accretion processes (Doolittle 1984). Creation of landscape capital effectively “banks” labor in material form for long-term savings in agricultural production costs (Brookfield 2001: 55). Second, while landscape capital encompasses skills, technology, and labor, the term has been applied in archaeology to fixed and permanent environmental improvements evidenced by material landscape features. These features had long-term benefits for multiple generations (Brookfield 2001: 216), and the chronological and social contexts in which landscape features such as irrigation canals were constructed could differ from the contexts in which those canals were later used. Unlike monetary capital, which is fluid in space but fixed in time and sociopolitical context, landscape capital is fixed in space but may prove to be “fluid” in time and sociopolitical context because of its enduring environmental benefits (Widgren 2007). Third, the term emphasizes the long-term management or maintenance practices frequently associated with the enduring function of landscape capital. Successive generations may add to agricultural improvements or simply manage or maintain existing features (Brookfield 2001: 216). Management and maintenance typically involve transfer of landscape knowledge and land-use

skills between generations. Thus, the existence and long-term persistence of certain forms of landscape capital may show how indigenous landscape knowledge shaped society and the environment through the enhancement and conservation of natural resources (Balée and Erickson 2006; Erickson and Walker 2009: 251).

The definition of landscape capital is theoretically broad, but its application in archaeology has been narrow. The original definition of landscape capital is explicitly agricultural—features that improve productivity beyond a single cropping cycle—but the general concept is not only applicable to agricultural societies. Hunter-gatherers and pastoralists may invest in the landscape for a variety of reasons and thus engineer their environments in patterned ways. These investments may be permanent features with long-term benefits and improvements to the availability of certain natural resources beyond the duration of a single hunting or herding season. They may also be used over multiple generations and may be added to or merely maintained. The concept of landscape capital is typically applied to monumental landscape features such as irrigation systems that required large amounts of labor to construct. There is no reason, however, why the concept could not apply to less spectacular features such as stone clearance features and even microscopic soil quality improvements (Brookfield 2001: 97, 168; Widgren 2007). In general archaeologists overlook the potential cumulative role of small-scale, often uncoordinated, potentially non-agriculture landscape features as landscape capital. Specific examples of such features include improved caves, platforms for temporary structures, animal shelters or enclosures, dams, and improved water sources in the forms of cisterns, reservoirs, and diversion channels.

In the context of landscape archaeology, the concepts of landscape capital and historical path dependence are closely related. Landscape capital refers to the cumulative investment over time by people in activities and physical structures that typically increase the productivity of the landscape. Historical path dependence refers to how such investments of labor and materials subsequently condition human activity. The fact that landscape capital, and to a certain degree,

historical path dependence, are defined and used only in the context of sedentary societies has to do with the influence of historical materialism on academic scholarship. In particular, it has to do with the tendencies discussed above to equate material with complexity and mobile societies with material “invisibility.” This bias also has its roots in modern political narratives that associate pastoralism with overgrazing, erosion, and general environmental degradation.

Path dependence and landscape capital might be applicable to pastoral nomadic landscapes, but a number of problems in definition and application exist. These two concepts have been developed from data on settled agrarian societies and typically emphasize the monumental, regional scale and heavy labor investment required to construct and maintain large systems of features. Like most landscape studies, these concepts focus on large spatial scales and in doing so tend to overlook or homogenize the activity and influence of households. A range of ethnographic, archaeological, and historical data would be necessary to fully answer the question of whether these concepts are applicable to small groups of mobile people inhabiting seasonal territories.

The term “landscape anchors” can serve as an overlapping concept to be applied in the context of mobile societies. This concept builds on and combines landscape capital and historical path dependence to highlight the characteristics and effects of anthropogenically modified resource nodes in the landscapes. In using the term, I highlight the ability of certain features, whether agricultural or not, to continue functioning long beyond the lives and intentions of the people who constructed them as well as the long-term maintenance practices that were involved in their use and reuse. Moreover, the term highlights the physical fixity of landscape capital in space, and its role in shaping successive periods of landscape use.

Ongoing ethnoarchaeological work on contemporary Bedouin agropastoral systems around the ancient Byzantine town of Avdat provides an example of how landscapes in the Israeli Negev have been structured by landscape anchors (Steven Rosen and Ariel Meraiot, personal communications). This work has found that small-scale interlinked systems of Bedouin land-use

were spatially and conceptually organized around geographical foci such as sites, structures, agricultural terraces, irrigation channels, cisterns, wells, rope grooves in bedrock, water troughs, storage spaces, threshing floors, rockshelters, caves, trees, orchards, and grave sites. All of these features were in continuous and modified use over multiple generations. The Bedouin fixed primary geographical foci such as water sources and grazing areas in canyons and wadis when they first immigrated to the area several hundred years ago. Their adoption of run-off irrigation techniques sometime later formed a new set of smaller-scale agricultural geographical foci spatially linked to the primary ones. Multiple levels of landscape anchors structure the way in which Bedouin organize space now and organized it in the past.

Landscape anchors might differ from agrarian landscape capital in a number of ways. Mobile pastoralists have much more fluid and dynamic land-use systems than sedentary agriculturalists, and this difference is likely to lead to basic differences in their conception, use, and modification of seasonal resources. Sedentary agricultural societies will transport the resources that they need for food production to a specific location. Sometimes, as with large-scale irrigation systems, this transportation of resources may even occur over regional distance. The landscape improvements and acts of environmental engineering undertaken by mobile pastoral societies may be likely to enhance local natural resources because of these societies' mobility. In their seasonal use by mobile groups, landscape anchors represent both past inhabitation (previous investments in the landscape) and possibilities for seasonal re-inhabitation (features continually enhancing the available resources and improving pastoral production). Landscape anchors may become like spatially fixed nodes in flexible networks of regional (interseasonal) and local (intra-seasonal) movement. Landscape anchors may function together, but they were not necessarily constructed or conceived as a system. Instead they should be seen as nodes in a local resource network whose constituent features change temporally. In the maintenance and use of landscape anchors, memory plays out in a different way than it does with landscape capital because there are seasonal interruptions in the use of the features.

Previous Archaeological Approaches to Pastoral Nomadism in the Near East

Pastoralist landscapes may have been shaped by landscape anchors, but existing models have often ignored their importance—and any type of pastoralist-generated landscape modification—on structuring inhabitation, largely assuming that itinerant pastoral communities inhabited only the marginal regions to which they were relegated in a mobile, but timeless, unchanging state of being.

Archaeological remains of pastoral nomads have rarely been found in the Near East. Only a handful of published excavations have revealed ancient tent foundations and campsite surfaces (Abdi, et al. 2002; Betts and Russell 2000; Hole 1974; 1975; 1978: 137; Hole, et al. 1969: 59; Mashkour 2002; Mashkour and Abdi 2002; Matney, et al. 2007; Rosen 1993; Saidel 2002; 2005; Wright 1981: 78) as well as more substantial architecture argued to have been used by mobile pastoralists in the past (Bernbeck 2008; Cohen 1992; Cohen and Dever 1981; Danti 2000; Hole 1999; Lyonnet 2009; Porter 2002; 2004; Rosen 2003). Several regional surveys have recorded pastoral nomad campsites and landscape features related to pastoral nomad land-use (Alizadeh and Ur 2007; Danti 2000; Rosen 1987). More often pastoral nomad groups have been inserted into archaeological interpretations via indirect evidence. Specifically the presence of pastoral nomad groups has often either been assumed on the basis of modern analogy (Hole 2003; Zagarell 1975; 1978) or been inferred from voids in regional settlement patterns (Adams 1981; Finkelstein and Perevoletsky 1990), based on the incorrect assumption that such people are archaeologically “invisible” (Cribb 1991b; Rosen 1992b). More sophisticated versions of these inferences on the basis of shifts in settlement patterns incorporate cuneiform texts, excavated features, and ethnography to support their conclusions (Kouchoukos 1998; Ur 2010).

While pastoral nomads are challenging to study, this “invisibility” is due to the methods and geographical foci of previous surveys. Traditional Near Eastern surveys cover large tracts of ground on alluvial plains and thus mostly recover large sites that have managed to escape the

destructive forces of agriculture. While such surveys have been useful for answering questions about Bronze and Iron Age urbanism, they have failed to provide systematic data on rural settlement and sites dating to other periods (Wilkinson, et al. 2004). Their coverage is not intensive enough to find small, ephemeral sites and they focus on areas where modern-day agriculture virtually eliminates the possibility that such evidence will survive (Ur and Hammer 2009: 37-38).

To recover data on the landscape anchors and the quotidian activities of pastoral nomads, archaeologists should focus on pastoral landscapes rather than sites. Campsites are the primary locus for the economic and social organization of pastoral nomad households, and it is here that archaeologists can most easily collect material data from a pastoral nomad lifestyle. Where recoverable, landscapes are equally if not more important for the reconstruction of social and economic dimensions of pastoral nomad groups.

Although they are uncommon, several archaeological surveys have been designed to record the material remains of pastoral nomads inhabitation and to investigate the landscape immediately surrounding campsites. The conclusions and methods of these surveys are important to consider in the design of the Hirbemerdon Tepe Survey.

The regional hinterland survey of the upland area east of Tell es-Sweyhat on the Syrian Euphrates is significant for its effort to recover a local system of nodes in Early Bronze Age pastoral nomad land-use and link this system to sedentary settlement patterns (Danti 2000). Specifically, low-mounded sites associated with Early Bronze Age pottery scatters were argued, by analogy with the excavated site of Hajji Ibrahim, to represent relatively permanent pastoral stations and storage centers on the steppe. Two aspects of its survey methodology are significant. The survey employed pedestrian and vehicle methodologies to cover large areas looking specifically for sites of a particular morphology assumed to be connected to pastoral nomadism and campsites of any form or period. This methodology had some success in recovering settlement patterns but was far less successful in recovering elements of broader spatial systems

of pastoral nomad land-use. It was not intensive enough to recover features systematically other than a single type of pastoral station, and did not investigate landscape features beyond campsites such as territorial markers. Further, the survey methodology was explicitly focused on the recovery of sites rather than a complete landscape and did not thoroughly investigate the natural features such as water and vegetation sources.

The only landscape archaeology of vertical transhumance in the Near East has been carried out in the Mughan Steppe of northwestern Iran (Alizadeh and Ur 2007). CORONA satellite photographs revealed the locations of several semi-subterranean animal enclosures that were intact in the late 1960s but have since been dismantled by irrigation agriculture in the lower steppe. Only those enclosures on higher, presently unirrigated ground were visible to the surveyors (Alizadeh and Ur 2007: 154-157). While this project could only investigate several features from the photographs and could not undertake an intensive survey of a pastoral nomad landscape due to time constraints, the survey of locations after they had been dismantled reveals important details about our ability to recover heavily disturbed campsites as well as important points to consider when interpreting the distribution of these features. The ceramic surface assemblage at plowed-out enclosures was limited to two or three sherds. The authors concluded that without CORONA photographs, ploughed out sites will require closely spaced survey transects for detection. Even with intensive survey methodologies, correct interpretation of recorded ceramic scatters would be difficult. The present distribution of remains, that is, their presence only in marginal regions, is indicative of landscape transformations and not of actual past camping distributions (Alizadeh and Ur 2007: 158).

The approach and methodology applied in this study is guided by the conclusions of five contributors to the literature on pastoral nomadic land-use. Richard Tapper's ethnographic work showed the role of local natural resources in understanding pastoral nomadic economic and social organization (Tapper 1979c), while Daniel Bates' ethnographic work showed how the social landscape of pasture rental agreements dictated social and spatial patterns of unity and

fragmentation (Bates 1973). The implication of this work is that archaeological treatments of pastoral nomadism must look beyond the campsite, at local landscape organization, if they are to understand factors affecting the organization of campsite inhabitants and the interactions of these inhabitants with surrounding communities. Claudia Chang's ethnoarchaeological investigation of herding landscapes in northern Greece investigates the material patterns in herders' daily movement decisions and pasturing strategies (Chang 1992: 66-67; 1993: 694-695). Chang shows that the local scale of movement ethnographies indicate is essential to our understanding of pastoral nomadism is materially recognizable. A few recent archaeological studies have broken free of the idea that pastoral nomads exist timelessly in marginal areas in order to investigate pastoral nomadic inhabitation at the landscape scale. A recent study shows that pastoral nomadic communities had significant effects on the broader geography of exchange in Eurasia (Frachetti 2008). Surveys in the Negev have been able to examine the landscape organization of desert-based pastoral nomads and investigate long term spatial patterns in the relationship between agricultural and pastoral groups (Rosen 1987; 1992a; 2008).

Recording empirical archaeological data on pastoral nomadism requires pedestrian surveys away from settled areas (e.g., Alizadeh 2008; Hole 1979: 195). A survey design must be intensive enough to document all surviving facets of a material landscape related to pastoral nomadic activities in a particular area. Small and intensive surveys enable archaeologists to recover the scale of land-use and movement related to daily pastoral activities and land-use over the course of a single season. The local landscape focus of such a survey should be balanced by consideration of the relationship between local landscapes and other spatiotemporal scales of pastoral land-use through an incorporation of ethnographic and historical data.

With this in mind, the Hirbemerdon Tepe Survey conducted an intensive pedestrian survey of the agriculturally marginal area at the east end of the Upper Tigris River Valley in southeastern Turkey. In four field seasons (2007-2009, 2010), the project recorded campsites, inhabitation areas, and the suite of natural and anthropogenic resource nodes surrounding them

(Laneri, et al. 2008; Ur and Hammer 2009). Three main conclusions about pastoral nomads are drawn from the characteristics and spatial distributions of the surveyed features. 1) Pastoral nomads altered their local landscapes for the purposes of sheltering humans and animals, collecting water, and improving pastures. Areas surrounding campsites contained abundant evidence of landscape management and capital investments in the herding potential of the area. 2) These investments were fixed, re-usable, and encouraged seasonal re-inhabitation of certain areas. Over time, these features became landscape anchors—geographic foci that structured the spatial organization of local landscapes. 3) The topographical position of domestic and herding features would have resulted in vertical daily movement patterns for humans and animals.

Goals of the Hirbemerdon Tepe Survey Project

The first step to developing more nuanced reconstructions of past mobile pastoral communities is to examine their historically specific land-use strategies and modes of inhabiting and transforming the landscape. Only by investigating the local landscapes in which pastoralists camped and herded can archaeologists begin to move towards describing pastoral nomadism not as a timeless lifestyle, but as a spatially and temporally heterogeneous set of land-use choices which necessitate particular environmental strategies. The analytic goal of the dissertation is to use archaeological, ethnoarchaeological, ethnographic, and historical data to reconstruct historically-specific pastoral nomadic land-use patterns of the last 500 years in southeastern Turkey and to examine the form and characteristics of the landscape anchors orienting regional and local movement patterns.

In addition to addressing the “silence” of pastoral nomads in Near Eastern history, this project makes several other broad historical and anthropological points. The focus of the present study on the last 500 years is unusual in the context of Near Eastern archaeology, which has concentrated on the pre-Islamic world. The history of “late” periods is often placed solely within

the realm of the discipline of text-based history. The archaeology of the Ottoman period is still in its infancy, in Turkey and elsewhere (Baram 2009; Baram and Carroll 2002). There is an unrealized potential in the Near East to use recent periods, once properly archaeologically reconstructed, as a source of working models to be tested on the deeper past. From a landscape archaeology perspective, features of recent periods are more likely to remain visible on the ground's surface and to provide fuller datasets for regional settlement patterns, movement, and human transformation of the environment. For the Ottoman period, a huge body of archival materials exists that pertains to the empire's administration of many parts of the Near East over several hundred years. Tax registers provide valuable diachronic demographic, economic, and social data on rural populations and rural landscapes for which there is otherwise very little historical information in any time period, and would be valuable tools for both planning archaeological projects and interpreting archaeological data concerning such landscapes. Further, reconstructing Ottoman period occupation and land-use in rural areas both historically and archaeologically can contribute to "mainstream" Near Eastern archaeology because it can help researchers to better visualize and appreciate the importance of low-intensity and rural occupation in earlier periods (LaBianca 2002: 213). The Hirbemerdon Tepe Survey shows that, even when enclosed by the Ottoman state, pastoral nomadic groups retained control over the organization of their landscapes and invested in permanent improvements that enhanced the availability of natural resources.

The anthropological significance of this project derives from its empirical investigation of an enduring phenomenon—the transformation of the natural environment into socially constructed places of significance. The vast field of anthropological, sociological, and geographic studies concerning "space" and its transformation into social "place" (e.g., Lefebvre 1991; Low and Lawrence-Zunigas 2003; Tuan 1977) has mostly focused on the creation of public and urban spaces in the context of sedentary societies. Yet private spaces and rural forms, including sites of natural resources, and even unmodified natural features (Balée and Erickson

2006; Bradley 2000; Schama 1995), undergo similar culturally- and historically-specific transformations into places of meaning through activity, perception, and memory. Landscape archaeology studies have tended to focus on regional-scale environmental alterations and cultural activities of place-making undertaken by societies as a whole. Here, I examine households or small-groups of households in the landscape, including the landscape transformations these households were capable of undertaking and the meaning that was invested in places through re-inhabitation and the construction of water collection and pasture improvement systems.

Summary of the Chapters

Chapter 2 reviews the ethnographic datasets on vertical pastoral nomadism in the Middle East that form the basis of analogies and interpretations of archaeological data. A critical synthesis of the available twentieth century data demonstrates that ethnographers focused their attention on either regional transhumance cycles or intra-campsite organization at the expense of local landscapes. However, the background descriptions of quotidian life in these ethnographies contain relevant details on local landscape modification and organization. A significant portion of the chapter is devoted to collating specific material information on local landscape activities, herding strategies, and pasture territories that help us make sense of the archaeological data collected in southeastern Turkey. The ethnographic accounts indicate that fixed infrastructure such as water collection basins, channels around springs, stone corrals, shacks, and modified caves were created and maintained by mobile groups to improve the herding resources of their summer and winter pasture areas. These fixed features functioned as landscape anchors, orienting pastoralists' local and regional movement patterns.

Chapter 3 describes the study area in southeastern Turkey . According to permit procedures and by design, it covers a microregion at the interface between two environmental and geomorphologic zones at the edge of the Upper Tigris River Valley in Diyarbakır province. The

survey of this area can only reveal winter camping patterns, and it is important to use other existing datasets to reconstruction patterns of regional transhumance. One such dataset is the government village inventories of the 1960s (İskân Plânlama Dairesi Başkanlığı 1966a; b; c). These records include information on demography, land-use, and agropastoral productivity of rural areas in the period just before mechanized farming became widespread in southeastern Turkey. Geographic, climatic, topographic, and ecological descriptions of the local and regional space allow an analysis of the possible routes used by vertical pastoral nomads in southeastern Turkey in the twentieth century and further elucidate the site formation processes affecting the archaeological record in the local study region.

Chapter 4 reviews the historical evidence for pastoral nomadism in southeastern Turkey over the last millennium. The relationship between sedentary agriculturalists and pastoral nomads has greatly shifted over time, from a medieval pattern of enclosing nomadism to an Ottoman pattern of enclosed nomadism. The historical data primarily illustrate sociopolitical relationships between pastoral nomadic groups and the Ottoman state, in particular the effects of the state on annual transhumance cycles and the locations of summer and winter territories. Ottoman records specifically concerning Diyarbakır *vilayet* suggest which areas of the Upper Tigris area would have been open for use as extensive pasture over the last 500 years. As the campsites in the archaeological survey region are located at the edge of a river plain, they constitute material evidence for long-term trends in the spatial relationship between pastoral nomads and sedentary agriculturalists over the last several centuries.

Chapter 5 describes the components of and rationale behind the study's intensive archaeological survey methodology. These survey methodologies draw from both Near Eastern survey methods and more intensive pedestrian survey methodologies developed in Greece and Italy. The major map and satellite imagery datasets used in fieldwork and analysis are described and compared.

Chapter 6 presents the results of the archaeological survey, in particular the characteristics and locations of sedentary settlements, agricultural fields, campsites, corrals, cairns, check dams, cisterns, caves, and other features. Most generally, the features documented demonstrate long-term economic investment throughout the entire local landscape, probably by both pastoral and agricultural groups. The Upper Tigris River Valley is technically the northeastern-most extension of the Mesopotamian plains, but several aspects of settlement models developed for northern Mesopotamia in the context of the Jazira in northeastern Syria and northern Iraq do not apply to the Upper Tigris. Conclusions about diachronic land-use patterns are hindered by a lack of chronology. Although some of the chronological problems stem from the survey teams inability to excavated surveyed sites, the problem of chronology is likely to always occur when looking at rural and upland landscapes whose mobile inhabitants may or may not have used ceramic vessels and whose mobile and sedentary inhabitants may or may not have used ceramic vessels that resembled those used at social and political centers on alluvial plains. Carbon-14 and other radiometric dating methods applicable to different types of landscape features are necessary to overcome this problem and to better document the evolution of “peripheral” landscapes and the landscapes of mobile peoples. Other regional datasets suggest that some of the survey’s conclusions hold for a wider area. These comparative regional datasets are drawn from a previous survey of the Upper Tigris River Valley and new analyses of high-resolution satellite imagery.

Chapter 7 analyzes in greater detail the distribution of surveyed features that relate to pastoral nomadic inhabitation. In particular, it examines the spatial relationships between the various classes of surveyed features and between these classes of features and the environment. Various analyses relying on multispectral satellite imagery and digital elevation models suggest the function of various classes of features and the potential factors that affected their placement in the landscape. Many classes of features contributed to the herding potential of the local area, oriented seasonal re-inhabitation of this area, and therefore should be considered as landscape

anchors. Furthermore, there may have been a basic division of the landscape between lower inhabitation and higher herding areas, and this organization would have necessitated a daily vertical movement pattern for pastoralists and their animals.

Chapter 8 concludes the study by arguing that pastoral nomads were important not only in the sociopolitical and economic development of Near Eastern societies, but also in the productive transformation of Near Eastern landscapes. Intensive surveys, targeted excavations, and radiometric dating programs have enormous potential to provide more complex diachronic reconstructions of pastoral nomadic land-use, sustainability, everyday movement, and senses of place.

CHAPTER 2: ETHNOGRAPHY OF PASTORAL NOMADIC LAND-USE

Introduction

Ethnographic studies of twentieth century pastoral nomads have served as the most significant body of data for archaeological models of pastoral nomadic groups in the past. It is hard to infer social, economic, and political organization from archaeological remains of mobile groups without significant, sustained analogy with models developed out of the study of living societies (Binford 1980; Cribb 1991b; David and Kramer 2001; Gamble 1991; Kramer 1982). Obviously ethnographic studies of twentieth century pastoral nomadic groups must play a role in firstly recognizing the remains of pre-modern pastoral nomadic inhabitation and secondly in hanging the organizational “flesh” on archaeologically attested camping and movement patterns.

This chapter reviews ethnographic work on the land-use patterns of pastoral nomads in the Middle East in order to set out the baseline data for analogy and interpretation in the archaeological case surrounding Hirbemerdon Tepe. The discussion will be restricted to data on transhumant groups from the Taurus and Zagros Mountain arc (Figure 2.1) that were studied at length in a monograph or dissertation, as these groups are closest in terms of geography and environmental context to the pastoral nomadic groups that may have used the Hirbemerdon Tepe area. Most of the important work on pastoral nomads in the Middle East was carried out in the 1950s-1970s, when a certain mode of ethnographic research was in style. A critical synthesis of the Middle Eastern ethnographies shows that work on pastoral nomadic land-use has focused on regional transhumance cycles and/or intra-campsite organization rather than on the immediate scale of movement and activity taking place in the local landscapes surrounding campsites. While ethnographies have in general neglected to study this immediate campsite catchment area or campsite hinterland as a landscape or system, they do provide relevant information on local landscape features and pasture arrangements. Local landscapes, herding patterns, landscape

knowledge, and pastoralists' senses of place have been the subject of recent ethnographies of sedentary pastoral societies in Scotland and New Zealand. Anecdotal information from nineteenth and early twentieth century travelers' accounts suggests that some ethnographic observations about campsite placement and pastoral landscapes were valid up to a century earlier in the Diyarbakır region of southeastern Turkey.



Figure 2.1: The Taurus-Zagros Mountain Arc

Collectively, the Middle Eastern ethnographies suggest that land-use and landscape organization were flexible and dependent on local factors. At regional and local scales outside societies shaped pastoral nomadic land-use, but at the local scale, pastoral land-use patterns were still also shaped by the landscape knowledge, investments, and decisions of herders. Most significantly for archaeologists, pastoralists' knowledge of and investment in the landscape is visible materially in the permanent features they constructed for the purposes of improving pasture and water resources. These features reduced the amount of labor necessary to carry out domestic and herding activities, were restored during seasonal re-occupation events, and could have oriented regional and local movement patterns over long periods of time. Such features

should therefore be considered “landscape anchors.” Like the road and irrigation systems discussed as “landesque capital” among sedentary agricultural societies (Blaikie and Brookfield 1987; Brookfield 2001; Erickson and Walker 2009), landscape anchors were one of the material ways by which pastoralists invested in land and expressed their sense of place. In emphasizing the construction and maintenance of landscape anchors as acts of local landscape knowledge and as acts of material investment that improve the productivity of the surrounding environment, the approach taken in this synthesis of Middle Eastern ethnographies parallels many of the ideas central to the historical ecology framework as applied in the Amazon (Balée and Erickson 2006).

Role of Ethnography in the Study of Pastoral Nomadism in the Middle East

Researchers concerned with the role of pre-modern pastoral nomadic groups in Middle Eastern society and history are both blessed and cursed with a wealth of ethnographic data describing the place of these groups in the twentieth century world. From the 1950s to 1970s, western academics conducted a variety of anthropological studies among the nomadic and semi-nomadic people of Turkey, Syria, Iraq, Iran, and Arabia, detailing tribes’ internal organization and relationships to their physical, social, and political environments (for a recent review of the Iranian literature, see Salzman 2002). Such studies provide fertile ground for the development of hypotheses about pre-twentieth century pastoral nomadic groups’ relations to their own worlds.

However, the assumed “invisibility” of mobile groups in the historical and archaeological records and the ephemeral impact of mobile groups’ activities in the landscape have frequently led historians and archaeologists to uncritically adopt these hypotheses as historical truths. This is particularly true of statements about land-use patterns. Twentieth century migration patterns are labeled traditional transhumance routes and thus become the paths that Iron Age pastoralists followed. An area falling within the pastures of modern nomadic groups and without highly

visible mounded sites is labeled a traditional pasture area and therefore becomes the space that was used as pasture in the Bronze Age.

Archaeologists have relied entirely too heavily on the rich ethnographic record and this over-reliance prohibits the recognition of agency and change in mobile societies of the past. One of the major conclusions frequently drawn from Barth's seminal ethnography of the Basseri of Iran is that the political organization of the tribe is distinct from the ecology and economy of pastoral nomad camps; that the processes operating in these two settings are quite different (Barth 1953; Tapper 2002a). Following Barth's insight, it has been argued that, while larger political groupings such as tribes and confederations are artifacts of external (and historically specific) political and cultural relations, basic nomadic communities have always been the product of the (more static) ecological conditions of pastoral nomadism and internal demographic and cultural factors. By naming ecology as the main factor structuring basic pastoral nomadic communities, archaeologists have felt free to project the ethnographic picture of communities occupying (presumed) similar environments back in time. In the absence of direct archaeological data, analogies drawn between "invisible" past pastoral nomadic groups and modern groups are accepted as fact rather than conjecture. In this way, historically specific land-use strategies are essentially reduced to reactions to environmental imperatives.

Despite these criticisms, ethnographies of pastoral nomadic groups and sedentary agropastoral societies in the Middle East must nonetheless remain central to the study of pre-modern pastoral nomadic groups in the region. Archaeological data relating to these groups, when it is recovered, are typically fragmentary and by nature can only illuminate one part of a mobile group's annual cycle. Sustained ethnographic analogy is frequently necessary in order to develop more holistic perspectives and argue for particular interpretations of ancient lifeways.

In order to use pastoral nomadic ethnographies critically, it is important to understand their collective limits as an academic genre. The driving force behind most of these studies, conducted in the 1950s-1970s, was a perceived endpoint in traditional societies and economies

across the globe. All twentieth century societies, including pastoral nomadic ones, had to adapt and adjust to changes in the globalized, modernized world. Pastoral nomadic societies in the mid-twentieth century in particular were faced with losses in territory, resources, and power as well as social changes that forced them to settle in cities, towns, and agropastoral villages. The concentration of research on pastoral nomadic communities during in this period left us with a synchronic view of these communities struggling to maintain their way of life under the spatial, economic, and political restrictions placed on them by territorial nation states. Similar disciplinary histories in various areas of the world have caused pastoral groups to be viewed as “immutably locked in a pastoral ‘mode of production,’” rather than as products of particular historical situations (Koster and Chang 1994: 2).

The changes pastoral nomadic communities faced in the decades from the 1950s to the 1970s meant that ethnographers typically focused on outside pressures as the causes of changes within the tribes rather than recognizing that there were both external and internal processes that had sustained pastoral nomadic lifestyles for centuries, if not millennia, in certain regions of the Middle East. Many studies (e.g., Barth 1964; Irons 1975) focused on marriage patterns and tribal organization, separating out the processes influencing sociopolitical organization from the tribe’s relationship to the physical and social environment (for more on this criticism, see Beck 1980: 328). As a result, pastoral nomadic land-use generally appears only in the background of the main narratives and arguments; in most cases the roles of pastoral nomadic knowledge and decision-making in shaping land-use patterns are not considered. Ethnographers commonly attributed a dominant role to ecology as a factor shaping pastoral nomadic societies (Tapper 1979b: 45), and typically discussed land-use either in the context of explaining how the environment influenced patterns of movement and residential association or in accounting for how political structure and tribal formations were related to the environment. Such studies generally did not, however, take up as a main focus of analysis the issue of how pastoral nomad communities positioned themselves within, and from that position actively modified, their

environments. They focused on pastoral nomadism as a general ecological adaptation rather than as a set of historically specific decisions and strategies based on detailed knowledge of animal ecology and local environment. Furthermore, in the analyses of their fieldwork, ethnographers working within this tradition were much more likely to consider how outside forces—e.g., societies, pressures, and environmental constraints—influenced pastoral nomadism, rather than considering how pastoral nomadic societies shaped other societies and their own environments.

Pastoral Nomadic Land-Use in Twentieth Century Ethnographies

Before discussing how an intensive archaeological survey will allow us to develop a perspective (contrary to the view outlined above) in which local landscapes are understood to represent products of pastoral nomadic land-use, it is necessary to review what we know about the land-use patterns—at any scale—of pastoral nomadism in the Middle East based on ethnography. Ethnographies have generally examined this topic at two extremes of spatiotemporal scale: the small, intra-campsite scale associated with everyday activities, and the large migration route scale associated with an annual transhumance cycle.

This synthesis of ethnography is generally restricted to data on Middle Eastern groups that practiced vertical (mountain-plain) pastoral nomadism, that primarily herded sheep and goat, and that have been studied at length in a monograph or dissertation. These groups fall into two geographical categories: pastoral nomads from the Iranian Zagros (Basseri, Lurs, Qashqā'i, Baharvand, Bakhtiari, Shahsevan) and pastoral nomads from the Anatolian Taurus (Saçıkara Yörük, Beritanlı, Alikanlı, various tribes wintering in the Cizre Plain) (Figure 2.2). In the 1950s-1970s, when most of these groups were studied, pastoral nomads in Turkey and Iran were similar in many respects, as outlined below, but also divergent in a number of ways. Most significantly for patterns of land-use, in comparison to pastoralists in Iran, pastoralists in Turkey were far

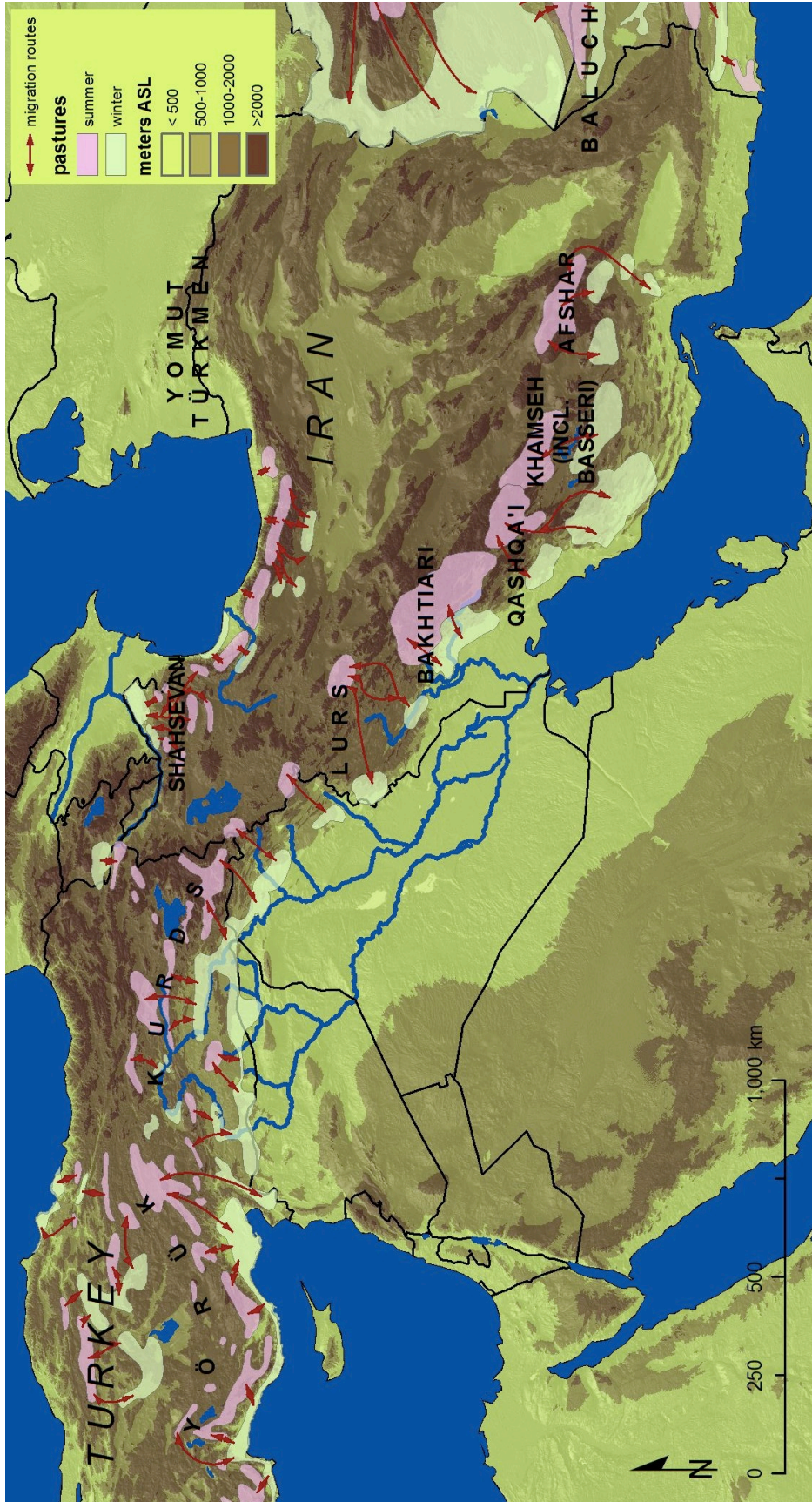


Figure 2.2: General location of the summer and winter territories and migration routes of the twentieth century tribes discussed in the chapter, after Tübinger Atlas des Vorderen Orients (Wehling 1992).

fewer in number, and they lived under a lesser degree of tribal and governmental control during their migrations and in their processes of securing pasture each year. This was in part due to the success of long-term efforts on the part of the Ottoman Empire to settle nomadic groups during the nineteenth century, as detailed in Chapter 4.

The groups geographically closest to the Hirbemerdon Tepe area are the Beritanlı and Alikanlı of southeastern Turkey (Figure 2.3). Both of these tribes used parts of the Upper Tigris River Valley as winter pastureland during the twentieth century. The Turkish government eventually settled some Beritanlı tribal members in a village that is currently located within the survey area. The history and changing pasture locations of these two groups are discussed in greater detail in Chapter 4.

The present chapter synthesizes land-use data on other tribes in addition to data concerning the Beritanlı and Alikanlı for several reasons. First, the ethnographic data on land-use among these two groups are limited. The detailed studies of these groups (Beşikçi 1992; Erhan 1992; Gülöksüz 1985) were primarily focused on tribal identity, political organization, and conditions surrounding their permanent settlement in villages, rather than on their camping patterns, migratory routes, and changes in land-use. Second, it is impossible to know for sure the tribal affiliation of households that used land around Hirbemerdon Tepe for winter pastures either in the recent or in the distant past. There does not seem to have been a clear separation between Beritanlı and Alikanlı winter pasture areas in the Upper Tigris River Valley, beyond the general principles that the Beritanlı remained nearer to Diyarbakır in the west, the Alikanlı remained nearer to Siirt in the east, and the two generally did not camp with or near each other (Erhan 1992: 157). Winter pasture usage must have been in continual flux, particularly in the face of massive agricultural expansion in southeastern Turkey during the twentieth century. These developments are discussed in greater detail in Chapters 3 and 4. Third, the documented history of the Beritanlı and Alikanlı is only 100-150 years old. Prior to the twentieth century, a greater number of tribes practiced a wider range of land-use patterns in the region.



Figure 2.3: General location of the summer and winter territories and migrations routes of tribes in southeastern Turkey, after Tübinger Atlas des Vorderen Orients (Wehling 1992).

The aim of this chapter is to look at various aspects of vertically transhumant pastoral land-use illuminated by ethnographies, not to suggest what patterns may have prevailed in the specific study area at the time of the twentieth century ethnographies. As land-use patterns have certainly changed drastically over time, it is useful to consider a broad range of ethnographic

examples when developing hypotheses about the archaeologically-documented patterns near Hirbemerdon Tepe.

Regional-Scale Movement Patterns

Vertical transhumance allowed pastoral nomads to make use of altitudinal differences in the seasonal availability of pasture and water. All groups in the Taurus and Zagros Mountains had a so-called “constricted-oscillatory” migration pattern involving movements between well-defined winter and summer pasture areas along a well-defined migration route (Johnson 1969: 170-173). Migration occurred along the same route in spring and autumn, between highland mountain pastures exploited in the summer and lowland plain pastures exploited in the winter. This vertical oscillation often involved traversing a number of mountain and valley systems and typically required pastoralists to traverse areas where the grazing land was completely or partially controlled by others. The length of migration routes varied; Kurdish tribes such as the Beritanlı and Alikanlı, the Yörük, Lurs, and the Bakhtiari all followed migration routes of less than 200 kilometers in each direction, while the Basseri and Qashqā'i had migration routes longer than 250 kilometers (Digard 1981: 13; Johnson 1969: 160-161; Skogseid 1993). Some Qashqā'i sub-tribes migrated up to 600 kilometers each way (Beck 2003: 294). The number of relocations involved in an annual transhumance cycle also varied widely. The Beritanlı changed camp sites 80-90 times per year (Skogseid 1993: 223), the Basseri around 120 times per year (Barth 1964: 15), and the Lurs and Yörük only around 30-45 or 30 times per year, respectively (Bates 1973; Black-Michaud 1986: 2).

The primary motivations behind migration were extreme seasonal variations in environmental conditions and the health of herds (Salzman 2002: 260). In the semi-arid areas within the Taurus-Zagros arc, upland pastures are lush in the spring/summer, but under snow for five or more months in the winter; lowland valley pastures are plentiful in the winter but dried out in the summer due to extreme heat and drought. Apart from pasture requirements, migration was

driven by the physical requirements of livestock. For example, the strains of sheep kept by the Basseri were larger and more productive, but also less tolerant of climatic extremes and therefore had to be moved between areas with mild summers and areas with mild winters. If families settled, 70-80% of their animals died (Barth 1964: 9). Other motivations behind migration included the market opportunity afforded by sedentary communities along migration routes, which allowed nomads to acquire agricultural products and sell surplus animal products. Traditionally, migrations were also an important time for diversifying diet, as nomads collected wild foodstuffs along their migration routes through different ecological zones (Beck 1998: 75). Some groups also used migration as a means of maintaining political and military independence (Irons 1975).

Migration scheduling and routes were affected by a number of factors, including the needs of animals, the distribution of available pasture, the presence of other wild and cultivated food resources, and political and social pressures exerted by governments and sedentary communities encountered throughout the year. By the mid-twentieth century, such political and social pressures were the major structuring forces for most groups' migration patterns. Daily discussions about how far to migrate and which routes to follow took into account animals' physical condition and the condition of open pasture (e.g., Beck 1991). Some pastoral nomadic groups who also engaged in agriculture shaped their migrations around the harvest times of their own crops (e.g. Salzman 1971b). However, the available options were severely constrained by Turkish and Iranian government regulations and the land-use patterns of other agricultural and pastoral groups. Groups who rented all of their pastures from agricultural villagers, such as the Yörük of southern Turkey, were subservient to the schedules of their sedentary neighbors (Bates 1971; 1973). In most places, such constraints would have been less significant for groups before the twentieth century. Migration scheduling and routes among the Qashqā'i in Iran changed during the period 1970-1998 due to expanding settlement, vehicle transportation of animals, governmental support, built roads, shifting water, pasture, and fodder availability with irrigation,

changing laws and conceptions of land rights, and changing hunting and firewood situations. The increased usage of modern harvesting equipment meant that higher stands of chaff were left in grain fields following the harvest, and the expansion of irrigation schemes increased the quality and quantity of natural vegetation surrounding fields. Thus, pastoral nomadic groups changed their migrations in order to follow harvest schedules, pasturing their animals on the chaff and the natural vegetation between fields (Beck 1998: 65).

Migratory route scheduling has been most fully described in the context of the Basseri *il rah* (Figure 2.4). The *il rah* (Persian; *el yolu* for Turkish-speaking Iranian groups) or tribal road was a schedule of traditional rights to utilize certain areas at particular times of the year. The scheduling of various vertical tribal migrations on a regional scale permitted a greater concentration of population in mountain-plain systems than would otherwise be possible. Groups were kept on their migratory route by a series of ecological and social pressures including snow, seasonal pasture status, and other nomadic and sedentary groups pursuing their own seasonal land-use schedules (Barth 1959: 7-8). The schedule was particularly important for ensuring that everyone successfully passed through the “bottlenecks” created by topography and the extent of sedentary settlement and agricultural land-use. Both space and time were conceived in terms of this migratory route: certain activities and localities were synonymous with each other and with particular times of year (Barth 1964: 148-153; Beck 1991).

Similar though more decentralized and apparently less relegated systems of regional transhumance patterns were described for nine tribes south of Lake Van in southeastern Turkey (Figure 2.5). Two basic routes were followed, with various tribal subsections merging into the routes gradually and converging at different points along the route according to their own schedules (Hütteroth 1959).

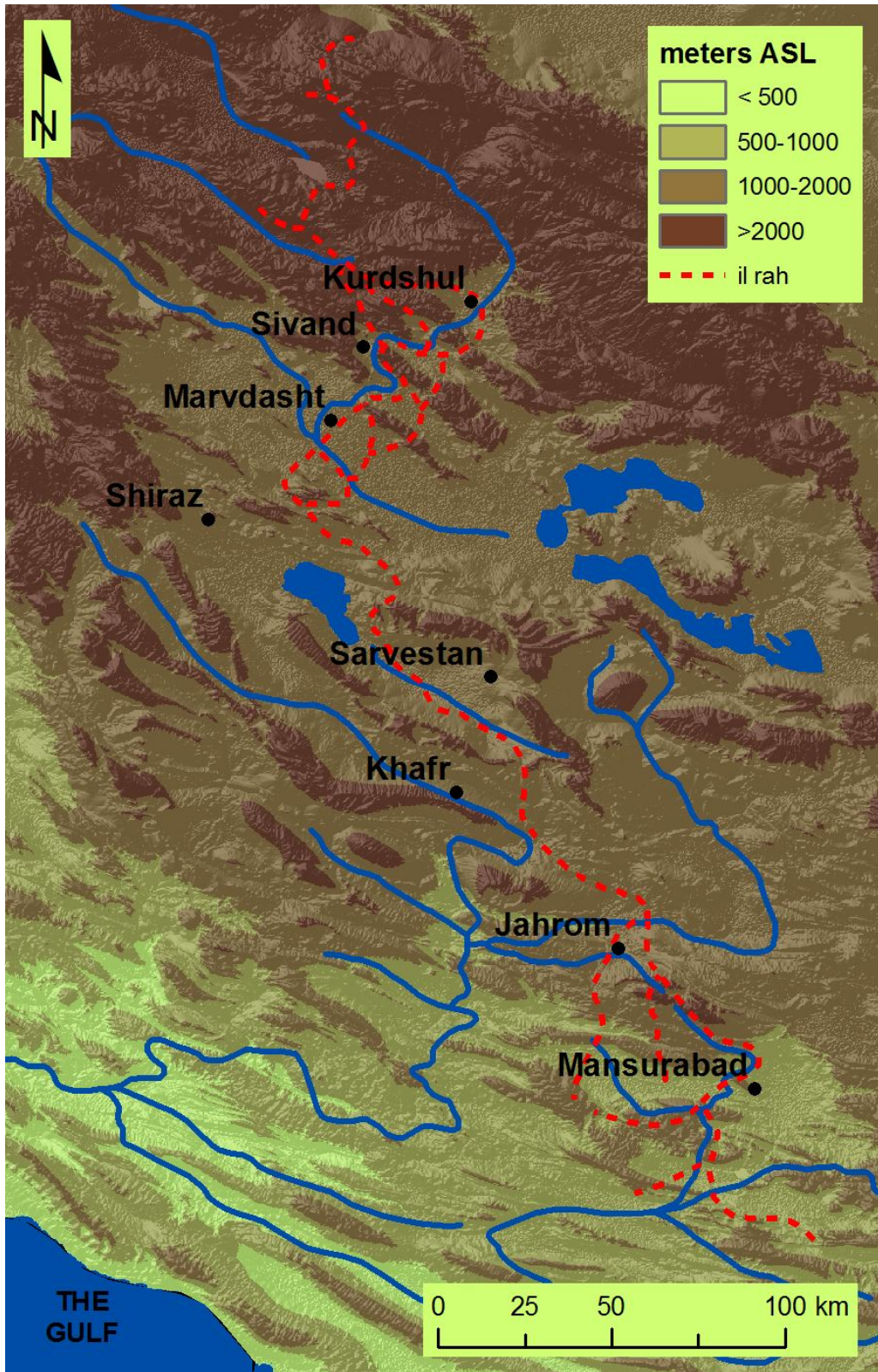


Figure 2.4: The Basseril rah in southwestern Iran in the 1950s. After Barth 1959.

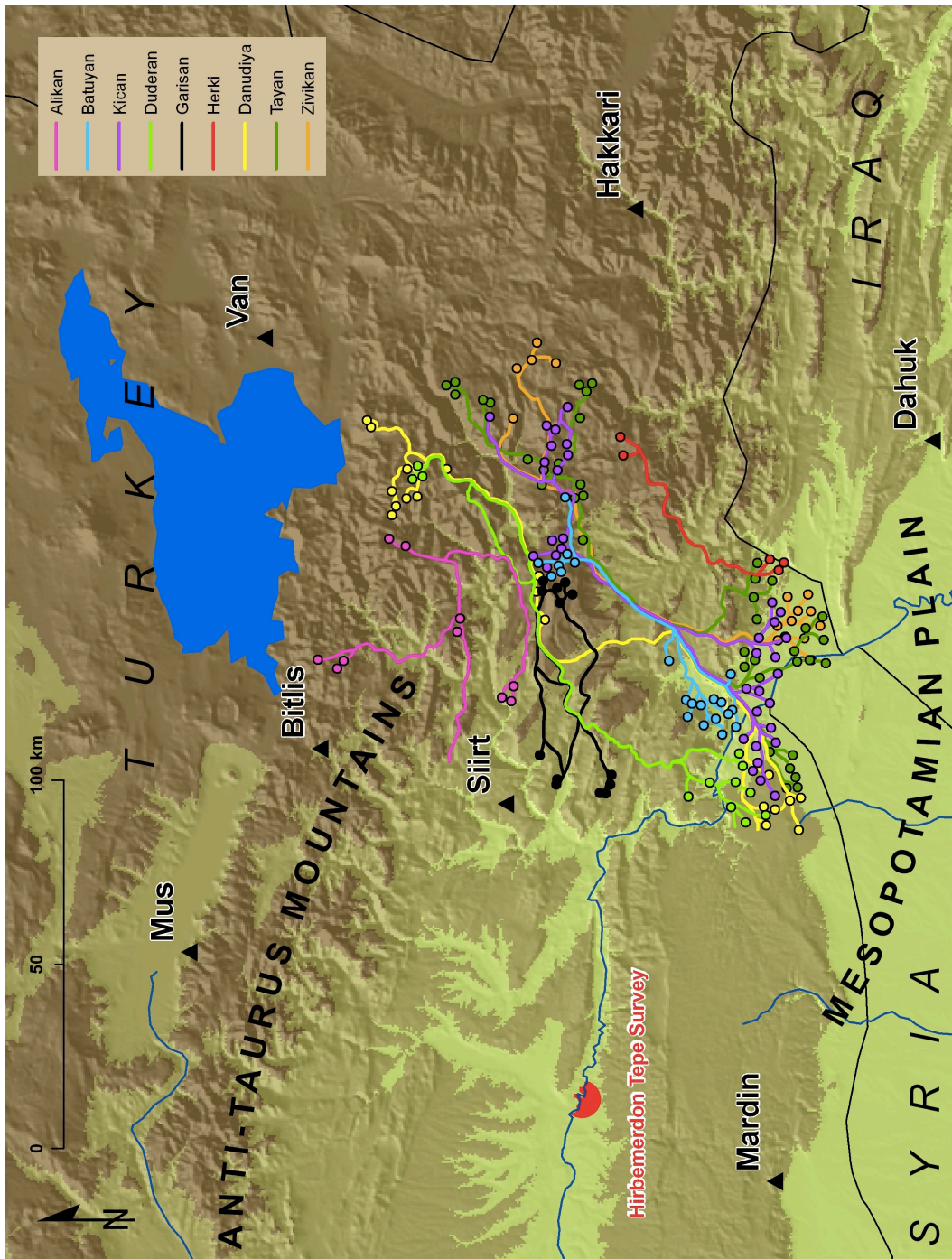


Figure 2.5: Migration routes of nine tribes of pastoral nomads south of Lake Van in the 1950s. After Hutteröth 1959.

Barth's description of the Basseri *il rah* is probably the most famous piece of literature on pastoral nomadic land-use, but such elaborate migratory scheduling only seems to have occurred within large Zagros tribes heavily regulated by the Iranian government. As this migratory

scheduling was made necessary by the spatial, social, and political pressures exerted by a nation state and widespread sedentary settlement, it seems reasonable to assume that migration routes and times were more variable before the twentieth century. In some parts of southeast Turkey in the mid-twentieth century, migrations were significantly more independent and dispersed. Small groups of Beritanlı followed diverse migration routes and did not move as one coordinated body as the Basseri did. However, groups did congregate where topography and available pastures reduced the number of possible routes (Skogseid 1993: 220)

Vertical migrations in the Taurus and Zagros mountains in the mid-twentieth century usually followed a schedule of 4-5 months in each of the winter and summer pastures and 1-2 month migrations in the spring and autumn. The exact timing of migrations varied from region to region depending on seasonal climate and could also vary year to year depending on weather and pasture conditions. For Kurdish tribes in southeastern Turkey in the 1950s, the spring migration usually began between mid-March and mid-May and the fall migration usually began in September (Johnson 1969: 36-37). In the late 1980s, Beritanlı nomads who wintered near Urfa, furthest away from the summer pastures, began their spring migration in mid-March, those who wintered near Diyarbakır began in the second week of April, and those who transported their animals by truck delayed the spring migration until the beginning of May (Skogseid 1993).

For groups who practiced agriculture as well as pastoral nomadism in the mid-twentieth century, the timing and route of the migration as well as the location of campsites may have been affected by the location and state of their own cultivated fields. Depending on altitude and climate, groups chose to cultivate at different times of year. The Lurs in Iran as well as Kurdish tribes wintering along the Upper Tigris River cultivated grain during the summer, often at locations along their spring migration route (Black-Michaud 1986; Frödin 1943), while the Qashqā'i cultivated grain in their winter pastures (Beck 1991). The effect of these fields on the migration depended on their location and the organization of the tribes. For example, Lurs congregated in the area of their fields in August in order to pasture their animals on the stubble

(Black-Michaud 1986). However, the Qashqā'i kept some tribal members sedentary in the area of their fields and typically stored the grain to be used as fodder during the autumn and winter. In the event of a bad winter, the animals were left to graze on the grain directly in the field (Beck 1991). The Bakhtiari cultivated in their winter and summer pastures simultaneously, and this agricultural workload exerted a strong influence on the timing of their transhumance cycle (Digard 2002: 76).

Along twentieth century migratory routes, pastoral nomadic groups avoided villages and towns as much as possible (Skogseid 1993: 222). Camps tended to move along the bottoms and edges of valleys. Herds kept to the valley slopes to avoid damaging crops in spring as well as to be closer to flowing springs (Amir-Moez 2002; Hütteroth 1959: 80-81; Johnson 1969: 37, 170-171). However, in autumn they moved along the valley floors within harvested fields and used wells because springs were frequently dry by this point of the year (Amir-Moez 2002; Beck 1991: 28). In spring the aim was to disperse camps as much as possible, but during autumn when natural pasture was lacking, larger groups formed and closely followed the paths of those ahead of them (Amir-Moez 2002: 197). In many areas, camps had rights of usufruct for 24 hours on uncultivated land (Beck 1991: 28; Skogseid 1993: 220; Tapper 1979a: 105). The distance traveled in a single day for the Qashqā'i, one of the groups with the longest migratory routes, was typically around 10 kilometers, but never more than 20 kilometers. Animals were typically grazed as much as possible along the migration routes in order to conserve the pasture in constricted summer and winter territories (Beck 1980: 331). As vehicle transportation became more common in the twentieth century, greater pressure was placed on summer and winter pastures (Tapper 2002b: 273).

Different political and ecological issues confronted pastoral nomadic groups at each stage of the migratory cycle. A common constraint in summer pastures was the lack of fuel in deforested highland areas, as fuel is necessary for the processing of milk products (Beck 1991: 258). During the autumn migration, both water and pasture were scarce (Amir-Moez 2002: 197-

198), and pastoral nomads had to rely on chaff in harvested grain fields (Beck 1991: 28).

Conflict frequently developed when pastoral nomads had to draw water from wells, springs, and channels already claimed and protected by settled people. A lack of water was the most common problem for winter camps. Although conflict between pastoral nomadic groups and sedentary villagers could arise at different points during the year, such conflicts were most frequent and most intense during the spring migration, when fields were planted and animals starved for fresh vegetation after the winter months. In summer pasture areas, constant conflict arose over rights to the vegetation that grows wild between fields, along irrigation canals, and beside streams (Beck 1991: 297). The size of migratory camps was determined not only by labor and resource requirements, but also by the security considerations arising from frequent conflict with sedentary neighbors (e.g., Skogseid 1993: 221)

The Internal Spatial Organization of Campsites

In addition to broad regional data, ethnographies frequently also provide site-scale information on tent layout and the internal structure of campsites (Cribb 1991a: 100-104, 122-161, 166-184, 189-207; 1991b; Digard 1975; Edelberg 1966-1967; Hole 2004; Tapper 1979c; Watson 1979). Groups in the Taurus and Zagros mountains universally used the Middle Eastern black tent constructed of woven goat hair, vertical poles, and ropes (Faegre 1979: 41-49). Depending on the season, tentsites could include a number of fixtures including hearths, storage/bedding platforms, leveled floors, channels for diverting water, and low foundation walls (Beck 1991; Cribb 1991b: 92-96). The form and size of the tent depended on the season (e.g., Amir-Moez 2002: 203). In general, winter tents tended to be broader because they were often erected on top of stone foundations, eliminating the need to extend the tent fabric all the way to the ground level (Hole 2004: 72). Tents were typically oriented downhill and tended to be spaced anywhere from 20-100 m from one another (Skogseid 1993: 229; Tapper 2002b: 271). The tent did not contain all of the activity of the household but was instead surrounded by various activity

areas (Hole 2004: 73). Artifact density and distribution analysis have been used to materially identify activity areas located around single tentsites (Cribb 1991b: 122-132, 172-184). Each group had norms for the placement of hearths, bedding platforms, and corrals as well as the definition of men's and women's spaces in the tent.

Among nomadic groups in the Zagros and Taurus mountains, tents were often arranged in parallel lines with similar alignment of individual structures and placed to ensure that each household had some privacy (e.g., Amir-Moez 2002: 203; Black-Michaud 1986: 37). A few groups (including the Lurs and Shahsevan) sometimes formed circular camps around a central corral or circular camps with the purpose of creating an "open air" corral in the center (Black-Michaud 1986: 38; Hole 2004: 74; Tapper 2002b: 271). The exact position of tents, corrals, and other structures varied according to environmental factors such as slope, shelter, aspect, and wind direction (Cribb 1991b: 139-142). Analysis of these factors is partially hampered by the fact that multiple tent and/or camp plans have not been published for many groups, including the Yörük, Basseri, Qashqā'i, Baharvand, and Shahsevan.

The form and layout of campsites also varied depending on their degree of permanence. Campsites and stone corrals were often used repeatedly (e.g., Beck 1991: 32; Watson 1979: 247). If the quantity and quality of pasture was favorable, camps could be quite sedentary in the winter and summer months, especially compared to transitory camps along the migration route (Bates 1973; Skogseid 1993: 226; Tapper 1979c). The Qashqā'i were fairly sedentary in both their winter and summer pastures, only changing locations a few times during the season for purposes of accessing fresh graze. A long stay at a particular site or repeated use typically resulted in a greater investment in fixtures at the campsite (Beck 1991: 79). Re-inhabitation typically involved restoring most of the existing corrals, stables, and shelters (Tapper 1979c: 86). Each time a group camped there, the group's composition and immediate needs were slightly different, so the material remains of the campsite reflected the characteristics of the most recent group to use the campsite (Hole 2004: 75). Periodically, campsites were shifted if water, pasture, or firewood

resources were depleted and/or if permanent fixtures at the campsite became unstable or collapsed (e.g., Beck 1991). For the Shahsevan this occurred around 15-20 years (Tapper 1979c: 86), and for the Beritanlı this could occur every 3-7 years (Skogseid 1993: 230), although some Beritanlı households used the same site for 30 years or more (Erhan 1992: 158).

One of the primary and most fascinating aspects of pastoral nomadism is that mobility offers groups continual opportunities for changing their residential associations. Accordingly, a great deal of literature has focused on the size and composition of camping groups. Size and composition of these groups was determined on the basis of kinship, conflict, labor needs, and pasture rental/ownership arrangements (Amanolahi-Baharvand 1975; Barth 1964; Bates 1973; Beck 1991; Black-Michaud 1986; Erhan 1992; Tapper 1979c). A century ago defense used to be an important consideration in camping group size, but in the mid-twentieth century, when raiding no longer occurred and natural predators such as wolves had been eliminated, camping groups became smaller (Tapper 1979a: 106). (For a comparison of tent size and number across different groups, see (Hole 2004: 70)). Among the Shahsevan, camping groups consisted of 2-6 households in summer and 10-15 in winter (Tapper 2002b: 271). On the Mesopotamian plains in southeastern Turkey, winter camps could include up to 50 tents (Skogseid 1993: 225), mostly for reasons of defense (Gülöksüz 1985: 72-73). The lower limit of how many tents camped together depended on labor needs and security issues, while the upper limit depended on the carrying capacity of the land (Hole 2004: 73-74) and water sources (Skogseid 1993: 227).

The distribution of available pasture was a particularly significant factor influencing the general seasonal dispersal or congregation of sub-tribal units. For example, the Qashqā'i and Shahsevan were more dispersed in the summer than in the winter because of the fragmentary nature of their summer pastures (Beck 1991; Tapper 1979c). However, the Basseri were more dispersed in winter because of severe pasture and water scarcity (Barth 1964). Depending on their pasture arrangements, individual households and herding groups were sometimes very limited in their ability to change their residential associations without forfeiting rights to

traditional pastures or losing large amounts of money in pasture rental fees (Bates 1973; Skogseid 1993; Tapper 1979c: 255).

Moving Beyond the Approach of the 1970s: Local Landscapes of Pastoral Nomadism

Bringing Landscapes and Daily Practices to the Foreground

In archaeologically and ethnographically examining the historically specific land-use patterns of pastoral nomadic communities in southeastern Turkey, my theoretical objective is to bring the local landscapes and the spatiality of daily practices of these groups to the foreground. The majority of pastoral nomadic ethnographies, I have argued, engage with space and land-use only in terms of the regional-scale transhumance cycle and the intra-campsite arrangement of tents. In largely neglecting to examine the local landscapes, hinterlands, or catchment zones surrounding campsites, ethnographers missed the opportunity to examine the agency of pastoral nomadic groups in manipulating and transforming their landscapes. They also missed the opportunity to understand daily activities in the landscape as ways of developing a sense of place and ways of accumulating knowledge that affected their land-use decisions. These daily activities—herding, gathering food and fodder, collecting water—involve non-migratory movement throughout a seasonal set of pastures.

For models of what a pastoral nomadic ethnography focused on landscape, agency, and daily practice might look like, I turn to two ethnographies of sedentary sheep herders in the hills of the Scottish borderlands (Gray 1999; 2000) and in the New Zealand high country (Dominy 2001). Gray's work described the activity of sheep herding as one of the primary ways of "place-making" in the Scottish borders and considers the ways in which shepherds encountered the hills of grazing land, perceived them, and invested them with significance. Instead of conceiving the pastures of the study area from a cartographic landscape perspective, Gray focused on the practices through which those who use spaces make them into meaningful places. He followed

shepherds on their daily rounds through their “hirsels”—the set of pastures they used—and was thus able to describe in detail how the shepherds interacted with natural and constructed features in the landscape (Gray 1999: 440). Shepherds structured their walks in relation to the topography and the movement of the flocks, positioning themselves at certain lookout points and choosing paths so that they could see all the sheep. These paths linked spatially and temporally the places where sheep tended to congregate and/or encounter danger (Gray 1999: 452). In order to herd, shepherds had to go around the terrain many times to become familiar with all the areas where a sheep might disappear from view. Sight lines were thus connected to the life and well-being of the herd. In walking around the terrain, shepherds considered sheep mobility, visibility, and risk (Gray 1999: 450-1). Walks around the hirsels were punctuated by places whose meanings derived from personal memories of herding events, and by associating their contemporary landscape to the activities of their ancestors, walking, herding, and landscape allowed shepherds to integrate themselves with a larger regional identity of the border area (Gray 1999: 454-456). The act of walking was not just about herding and gathering sheep, but also creating places of meaning and gathering these places/pastures into a region called a hirsels (Gray 1999: 452).

Similarly, Dominy’s work in the high country of New Zealand’s South Island examined the ways in which families claimed, sustained, and perceived connections with the land and configured geography through sheep and sheep rearing (Dominy 2001). Like Gray (Gray 1999: 442-443), Dominy emphasizes the importance of specific yet expansive landscape knowledge gained through both intergenerational sharing of skills and the individual daily experience of walking during the course of herding sheep. Caring for and herding sheep demanded “ ‘...knowing how geography works,’ having a sense of how the land falls, where sheep might hide and how they move, or knowing where to stand on visually smooth grasslands whose undulations and six-foot tussocks can block the line of sight when looking for sheep...” (Dominy 2001: 158). Highland and pasture areas throughout the world have been ignored as “peripheral” and “marginal” and defined only in relation to urban and agricultural areas. Through descriptions of

homestead and pasture layout, daily and seasonal movement, systems of land classification, and traditional knowledge of the land, Dominy engaged in a broader effort to restore agency to the people living in these “peripheries” (Dominy 2001: 3). She breaks down the dichotomies between nature and culture; extractive/consumptive and conservation activities by demonstrating how areas that outsiders may have perceived as untamed wilderness were positively transformed and productively controlled physically and conceptually through animal husbandry (Dominy 2001: 262). To the trained and experienced eye, the pastoral landscape was divided through actively maintained fences and paddocks and modified through pasture planting, enhancement, and conservation. The New Zealand pastoral homestead and its grounds “continuously change through a process of accretion and reconfiguration....The built environment is a cumulative identity marker denoting the continuity of family inhabitation over the generations as well as the particular historical and personal experiences of the individuals whose inhabitation moves through it” (Dominy 2001: 102).

There are several aspects of these ethnographies that are interesting to consider in relation to Middle Eastern ethnographies of pastoral nomadic groups. Unlike the Middle Eastern ethnographers, Gray and Dominy brought the local landscape to the foreground by focusing on lived spatiality through herding. Gray and Dominy both recognize that shepherds organize and experience their daily lives around the requirements of their sheep and examine the logic and practices behind the creation of certain herding paths and the use of certain herding strategies. This investigation lead them both to a productive discussion of how places were created in relation to the movements of animals and people as well as how sense of place was expressed through knowledge about sheep and landscape.

The analytical aim of the Hirbemerdon Tepe Survey is to examine some of these same issues archaeologically: the organization of local landscape and non-migratory movements in seasonal territories. Some of the meaning-making processes that Gray and Dominy investigate seemingly do not have material expressions and therefore cannot be accessed archaeologically.

However, the sites and landscape features that result from these processes can be recovered through archaeology. The position of archaeological campsites and landscape features around Hirbemerdon Tepe might enable the reconstruction of paths created by daily movements in the landscape. If the general locations of herding areas are identified, the topographic lookout points that both ethnographers (Dominy 2001: 159; Gray 1999: 451) discussed as being central to herding rounds because of their role in ensuring the welfare of sheep might be recognizable. In the course of investigating local pastoral landscape organization and daily movement patterns near Hirbemerdon Tepe, the archaeological study will demonstrate that pastoral landscapes were actively and productively transformed to fulfill human and animal needs.

Local Landscapes of Pastoral Nomadism

In discussing “local landscapes of pastoral nomadism,” I refer to the natural and man-made landscapes of resources and settlement immediately surrounding a campsite. Landscape entails not only the locations of resources and settlement, but also patterns of movement and perception relating to resource use and interaction with surrounding communities. A local landscape approach seeks to examine households and herding collectives in space. The landscape immediately surrounding a campsite is the spatial scale at which these social units operate within a single season and the spatial scale relating to the daily lives of campsite inhabitants.

The activities occurring at this spatial scale include pasturing and watering animals, collecting wild resources for human and animal consumption, building corrals and tentsites, sheltering animals in structures and caves, interacting with surrounding communities, modifying and using features already in the landscape (abandoned campsites, abandoned villages, and cairn fields, for example), improving pasture and access to water sources, and creating, marking, and maintaining pasture boundaries and paths. This set of activities occurs repeatedly and forms the basis for people’s physical and cognitive relationship to the immediate landscape. Other activities occurring at the scale of the immediate landscape occur only once in a season. For

instance, selection of campsite location and pasture location structures the organization of the immediate landscape. Local landscapes should be constituted in a number of archaeologically and/or ethnographically observable material patterns, including campsite location and spacing, the arrangement of a suite of natural and man-made features around a camp (corrals, springs, cisterns, dams, caves), the distribution of areas with good vegetation for pasturing, spatial patterns of water acquisition and pasture selection, and spatial patterns of interaction with surrounding communities.

The ethnographic data discussed below provide a basis for understanding what landscape features, processes, and activities combined to form the local landscapes of camps inhabited by vertically transhumant pastoral nomads in the Taurus and Zagros areas. The purpose of synthesizing these data is to begin to provide a picture of the “lived spatiality” expressed in Gray’s ethnography of sheep herding.

Landscape Elements in Ethnographies of Vertical Pastoral Nomadism in the Near East

Though ethnographies of pastoral nomadic typically do not explicitly examine the local landscapes surrounding campsites, their background descriptions of the environment and their analyses of ecological conditions influencing social and political organization contain useful information on many of the features, processes, and activities present in the immediate catchment zones or hinterlands of pastoral nomadic campsites. An archaeological examination of local landscapes of pastoral nomadism must draw on these aspects of the ethnographic studies for comparative data on camping group composition, campsite location, local distribution of pasture areas, pasture allocation systems, social and material aspects of territoriality, herding strategies, water acquisition, and the use of landscape features such as cairns and caves. In previous research on vertically transhumant pastoralists in the Middle East this suite of aspects has been most fully considered for the Shahsevan of Iran, but important comparative data can be drawn

from a variety of ethnographies on Iranian and Anatolian groups. In describing local patterns of land-use, it is also useful to draw on ethnographies of rural villages for a broader picture of the rural agropastoral system in Turkey and Iran (Horne 1994; Kolars 1963; Kramer 1982; Watson 1979; Yakar 2000). These studies additionally contribute information on how other types of herding (including village-based herding and short-distance pastoral transhumance) fit into systems of rural land-use. The various ethnographic datasets indicate that the elements of a local landscape should look rather different at different points in the annual transhumance cycle and that they also change temporally. These datasets also indicate that pastoral nomadic groups had visible, material effects on their immediate landscapes.

Campsite Location

Throughout the Iranian and Turkish ethnographies, factors affecting the location of campsites throughout the year included the availability of pasture, water, and fuel, the presence of agriculture and sedentary settlement, the location of deserted villages/archaeological sites, and terrain. These factors did not interact in a hierarchical manner of importance or preference. Rather, different locational factors were relevant at different scales of resolution. For example, topographic and climatic factors imposed broad limits on campsite location at a regional scale while the distribution of natural resources and sedentary settlement affected campsite location at local and site-specific scales (Cribb 1991b: 134-139, 151-153). In selecting a campsite, pastoralists always took advantage of flat locations in dry seasons and sloped locations in rainy seasons, as well as sites that provided shelter from prevailing winds and access to water and good pasture (Amir-Moez 2002: 199, 203; Hole 2004: 77). Among agro-pastoral groups in Iran, the location of winter herding stations was limited by pasture conditions more than water sources (which were up to 4 kilometers away) and the location of summer milking stations was limited more by water sources than pasture and firewood availability (Horne 1980: 14; 1994: 42-43, 62-

65). However, only single shepherds used these pastoral stations. The factors influencing camps inhabited by households are more complex.

For the purposes of the present study, a particularly important issue is the locational characteristics of winter campsites. Winter campsites were located at lower altitudes, often in river valleys, and thus often brought pastoral nomads into spatial association with sedentary agricultural communities. Two sources of winter pastureland existed: open uncultivated land made lush by winter rains and fallow fields. The possibility of crop damage created the potential for conflict between nomadic and sedentary communities during the spring and summer months, and nomadic herds were kept away from agricultural fields. During the autumn and winter, however, these fields were fallow and herds could be pastured on crop stubble. The two advantages for the farmer were the possibility to collect field rental fees and the deposit of fertilizing dung into the fields (Cribb 1991b: 135). Grazing on post-harvest crop stubble was particularly common following the expansion of modern agriculture, which has reduced the amount of open grazing land, and following the introduction of harvest machines. Previously, crops were cut closer to their roots with the use of hand sickles. Modern mechanized combines, however, leave as much as 15 centimeters of stubble, which is excellent for grazing (Beck 1998: 70).

Despite the spatial and ecological compatibility of agricultural and pastoral systems during the winter, their spatial integration declined. In the twentieth century, the expansion of peasant agriculture and urban settlement in lowland areas forced pastoral nomads in southeastern Turkey to winter on progressively higher slopes with marginal pasture and water sources (Frödin 1943; Johnson 1969: 22-24; Kolars 1963).

The winter pasture situation, and thus the size, spacing, and permanence of winter campsites varied from region to region in the Taurus and Zagros mountains due to climatic differences and historical land-use patterns. In the area of southern Turkey inhabited by the Yörük, the mild, humid winter climate of the Çukurova and Amuq Plains permitted multi-

cropping systems. The expansion of agriculture in the twentieth century left very little land uncultivated, and year-round agriculture meant that only small tracts of land were available in the winter for 2-4 Yörük tents to rent on a shifting basis. Once rental fees were paid, households remained stationary for the season (Aswad 1971; Bates 1973: 9-11). In the Upper Mesopotamian plains of southeastern Turkey, Ottoman policies resulted in the consolidation of land in the hands of large estate holders (Lewis 1968; Yalman 1979). The ability of these big landowners to exploit farm mechanization and new wheat hybrids led to the decline of sharecropping and tenant farming in the twentieth century (Yalman 1979). These developments and a change in farming practice from biennial fallow to annual harvest left substantial tracts of land open for winter use by pastoral nomads. Accordingly, Beritanlı pastoral nomads had winter campsites of 20-50 tents (Skogseid 1993: 225-226) and were able to change campsites a few times during the season. In Iran, the government allotted pastures to many groups, and for the Qashqā'i the winter pastures that were sufficient to allow whole sub-tribal units to camp in the same area. In the case of the Qermezi sub-tribe, 65 households camped in a single winter pasture area in 18 camping units of 1-10 households (Beck 1991: 79).

If sources of pasture in the winter were limited, campsites tended to consist of a smaller number of tents and tended to be more dispersed across the landscape than summer campsites. The Basseri congregated in summer pastures to form camps of 10-40 tents, but herding units of 2-5 tents dispersed in winter (Barth 1964). This was not universally the case, however. Among the Shahsevan, winter campsites had more tents than summer campsites because summer pastures were smaller and more dispersed than winter pasture in the Mughan Steppe (Tapper 1979a: 104; 1979c: 250).

Campsites tended to be located closer to sedentary villages in the winter than in the summer (Bates 1973: 20). This situation had to do with the fact that settlement density was higher in river valleys than in upland mountain regions. Furthermore, pastoralists rented fields for pasturing purposes only in winter, and these fields tended to be located close to the sedentary

agricultural communities tilling them. Thus, winter camping groups were maximally dispersed across the landscape but also tended to cluster near agricultural fields and settlements (Cribb 1991b: 137). Among the Alikanlı in southeastern Turkey, this pattern appeared in the form of 4-5 tents attached to a village (Beşikçi 1992). The quality and quantity of pasture in the winter camping area placed demographic and spatial constraints on the entire transhumance system because the winter was the most difficult time of year both for animal survival and for locating adequate pastures (Barth 1959: 8; Bates 1973: 129, 218; Cribb 1991b: 135). Summer pastures tended to be underutilized because the maximum herd size was determined by the situation in the winters (Cribb 1991b: 135).

Winter land-use patterns have been described ethnographically in detail for several groups. For comparative purposes, I discuss some patterns documented among the Qashqā'i and the Beritanlı. As has already been noted, the Qermezi sub-tribe of the Qashqā'i confederacy used winter pastures assigned to them by the Iranian government. The main problem with these pastures was a lack of water. At least once a day, herds had to be driven to a well located in the plain below the winter pasture area. Families also had to transport water for human and animal consumption from the well via pack animals, a round trip of 6 hours. When they first entered the area, they occupied autumn campsites in depressions and shallow ravines that protected them from wind and rain but where sudden torrents of runoff from rain would not threaten livestock and people. Tentsites were leveled and covered with gravel, stone and mud tent foundations were erected, and shallow trenches were dug to divert water around the tentsite. Later, the Qermezi moved to winter campsites, separated by half a kilometer or more from each other, in more protected, deeper ravines. These sites had been constructed and improved over the years, and included several permanent animal and storage huts as well as stone corrals. Some campsites had natural caves that families used to protect animals from the elements and to store straw and equipment. Near these campsites, the Qermezi men had dug earthen basins for the collection of rain and surface run-off. However, these basins would not fill until the ground had already been

significantly moistened by rain and snow, and the water they held only lasted a few weeks.

Pastoral nomadic families also relied on rain to water their wheat and barley fields, which were planted in the winter pasture areas. Animals were grazed on natural vegetation and grain stored from their previous harvests (Beck 1991: 75-165). The improvements that the Qermezi made to their campsites in winter pastures stand in contrast to the relative lack of improvements made to their campsites in summer pastures, land that they also controlled. In particular, the Qermezi did not construct summer enclosures for their animals because of favorable weather and a lack of wild predators (Beck 1991: 296).

The Beritanlı, as has also already been noted, camped on uncultivated land in the Turkish section of the Upper Mesopotamian plains during the winter. They pastured their animals mainly on the stubble of fields belonging to large agricultural estates. The exclusive right to pasture animals on these fields for a certain period of time was obtained via contracts between the landowner and the individual herd owner. The fees were calculated per 2 head of livestock and could be as much as 1/10 the value of a grown sheep. Like the Qashqā'i, water was the main problem facing the Beritanlı in their winter pastures. The location of camps was primarily determined on the basis of the location of wells and other water sources. These sources were scarce, and thus it was not the carrying capacity of the winter graze, but the scarcity of water sources (confining the grazing land that actually could be exploited) that placed limits on the size of herds and the number of nomadic households (Skogseid 1993: 224-227).

Local Pasture Distribution and Allocation

The local distribution of pasture areas is a particularly under-studied factor in ethnographies of pastoral nomadism. Pasture must be considered both in terms of its natural distribution as well as in terms of the social landscape of pasture areas available to specific pastoral nomadic groups. The locations of sedentary settlements, agricultural fields, and territories of other pastoral nomadic groups may restrict a particular group's access to natural

pasture areas. Except for Cribb, ethnographers of Middle Eastern pastoral nomadism have largely neglected this topic. An abstract spatial model predicts the relationship between the size of camping groups and pasture (Cribb 1991b: 143-144). Specifically, the density of campsites will vary according to the continuity/discontinuity and quality of pasture tracts as well as the ratio of humans to animals (Cribb 1991b: 135). This model is supported by the observations above that the congregation and dispersal of ethnographically studied groups at different points in the year depended on the continuity or fragmentation of pasture areas.

Sociopolitical systems of pasture allocation have, however, occasionally been addressed. Pasture allocation affects all pastoral nomadic societies, and so it is surprising that this topic has not been explicitly addressed by a greater number of ethnographies (Tapper 1979a: 95). Part of the problem in investigating the allocation of pasture lies in an absence of data on the social composition and organization of middle-scale subgroups within pastoral nomadic groups. Land-use data tend to concern either the annual transhumance or intra-campsite level; in a parallel situation, ethnographic study has tended to focus on social organization at either the tribal or the household and camping group levels. There has been little investigation of middle-scale communities forming what have been termed “local exploitation groups” (Dyson-Hudson 1972: 11), “wider camp clusters” (Pehrson 1966: 100), and “micro-pastoral orbits” (Pastner 1971)—essentially the groups of tents that frequently camp together near one another (Digard 1979: 49; Sweet 1965) and, in some pastoral nomadic societies such as the Shahsevan, that serve to organize the allocation of pasture tracts (all cited in Tapper 1979b: 49). An exception to these generalizations is one ethnography documenting the decision-making authority of a subtribal section headman (Beck 1991).

Three different systems of pasture rental and ownership have been documented under twentieth-century conditions. First, pasture may be owned by a group and inherited among its members. Ownership of the territory may be held collectively at the level of a major tribal group (e.g., the Basseri, Barth 1964), collectively at the level of a tribal subgroup (e.g., the Yomut

Türkmen and the pre-twentieth century Shahsevan, Irons 1975; Tapper 1979c: 258), or individually at the level of the household head (e.g., the twentieth-century Shahsevan and the Qashqā'i, Amir-Moez 2002; Tapper 1979c). Second, tribal territory may be held in the name of a leader. Third, pastoral nomads may establish rental systems with sedentary villages or landowners, either collectively (e.g., the Alikanlı, Beşikçi 1992) or individually (e.g., the Saçıkara Yörük, Bates 1973). Some groups practiced a combination of these ways of obtaining pasture. For example, the Beritanlı relied on rental agreements, traditional claims, and political alliances to gain access to pastures at different points in the annual transhumance cycle (Skogseid 1993: 216-217). Variation among different groups in modes of acquiring, controlling, and allocating pasture may be paralleled by seasonal variations and variations at a larger temporal scale, as when the Qashqā'i transitioned from a system of individual pasture acquisition and rental to an older system of collective tenure and allocation by the tribe in post-revolutionary Iran (Beck 1980; 1998; Cribb 1991b: 56).

These various pasture acquisition schemes have three common features. First, grazing rights were often rights of usufruct rather than exclusive rights of ownership (Barth 1959; Tapper 1979a: 96, 99). Pasture rights often included the right to draw water from public sources and to graze herds on uncultivated lands. Second, explaining the utilization of pasture resources involves documenting the coexistence and intermingling of various types of transhumant and settled populations herding animals. These groups include herders based in sedentary villages, short distance transhumance herders, and long distance transhumant herders (Barth 1962: 342-343; Horne 1994; Watson 1979). Third, the security of pasture tenure was a major factor influencing the degree of effort invested in campsite architecture (Cribb 1991b: 110) and should also be a major factor influencing land-use decisions, elaboration of constructed landscape features, and landscape organization.

Grazing rights and pasture allocation have been most extensively investigated among the Shahsevan (Tapper 1979a; c). Pastures were owned and managed as estates by individual

subgroups and lineages. Grazing rights were allocated by large tribal sections and then suballocated to individual camping groups by elders (Tapper 1979a: 99). Rights to certain pastures were inherited and large pasture tracts were named. These pastures were measured as a fraction of the named pasture in terms of cash value. When suballocating pastures to certain camp groups, both the quality and quantity of pasture were taken into account to ensure fair division (Tapper 1979a: 107). Occasionally pasture rights could be bought or sold. Transactions in pasture were possible for summer pastures, but not for winter pastures in the Mughan Steppe, as winter residence in this area was a requirement of Shahsevan tribal membership (Tapper 1979a: 109). Generally, the more predictable the local variations in pasture and water conditions, the more permanent the allocations and suballocations of the territory could be (Tapper 1979c).

Despite these ethnographic treatments, quantitative and spatial description of pasture areas and their distribution are critical missing pieces in understanding local pastoral nomadic landscapes. Such data were recorded for the Shahsevan, the group for which we have the best ethnographic investigation of pastures. Named pastures average around 1200 ha in size. The quality and quantity of pasture covaried with the size and political power of the social group controlling it (Tapper 1979a: 103). The ideal winter estate of a Shahsevan camping/herding group was a contiguous area shaped as a circle of up to eight kilometers radius with the camp itself at the center (Tapper 1979a: 107). This radial distance is the distance that a flock of sheep could daily travel out and then back (Spencer 1973: 15; cited in Tapper 1979a: 107). As the Shahsevan summer pastures were more fragmented due to the natural terrain, a single herding group's estate typically included tracts in several different named pastures, totaling around 100 ha. The circle shape for winter pastures was considered ideal from a defensive point of view. The more elongated a pasture estate is in shape, the more difficult it became to protect from trespassers, primarily other herders grazing their flocks. The continuous area of a winter pasture was grazed "methodically throughout late autumn and winter," but this system was not described or investigated further (Tapper 1979a: 107). The only clue to this system and its logic comes

from a description of pasture terminology and conception. In both summer and winter camping areas, the exclusive rights to pasture applied only to grazing on a season's fresh vegetation. Once first-growth vegetation was consumed, other groups had the right to enter a group's territory and utilize second-growth vegetation. A camp's grazing program thus aimed to maintain a reserve of fresh vegetation in their pasture tract as long as possible, therefore preserving for as long as possible their exclusive rights to the second-growth vegetation (Tapper 1979a: 106).

Several ethnographies of village-based and semi-transhumant agro-pastoral societies provide quantitative and spatial description of pasture areas for comparison. Summer milking stations inhabited by transhumant shepherds (not households) in northeast Iran exploited grazing areas in a semi-circle 3 kilometers in radius away from mountainside springs (Nyerges 1980: 39). Shepherds based in agropastoral villages in the Zagros Mountains of western Iran herded the flocks 3 kilometers out from the village and then back in the span of a single day (Watson 1979: 98-104). On dry farming plains in the Middle East, naturally available pasture is nearly continuous. However, the presence of traditional subsistence agropastoral villages creates an "oasis pattern" in which nucleated villages and fields are separated by stretches of pasture or wasteland (Horne 1994: 50). Pastoralism in east Africa is point-centered, with daily grazing orbits occurring around pastoral camps or agropastoral villages located 0-6 kilometers from surface water sources (Coppolillo 2000).

Herding Strategies

Herding strategies are only rarely discussed in the ethnographies, and only appear as part of the background on land-use. The ethnographies recognize the general importance of such strategies, as they report that they were a frequent topic of discussion among herders and community leaders (Beck 1991: 285; Tapper 1979c: 86). However, the ethnographers did not discuss the importance of herding strategies for understanding daily movement patterns surrounding the campsite, and tie such strategies into pastoral nomads' ways of perceiving and

dividing the landscape. Thus, the discussion below can only offer glimpses of a few different grazing strategies in particular areas among particular groups.

The issue of herding strategies has already been alluded to above, as the description of an ideal winter estate of a Shahsevan camping group included not only the dimensions and layout of the estate, but also strategies for the use of first and second growth vegetation within it. In the Shahsevan summer pastures, shepherds conserved first growth vegetation by switching herds between first and second growth vegetation throughout the day. At dawn, the shepherds took both the ewes and the wethers straight to the first-growth to graze until they were full, then to the second growth to ruminate and sleep on a hillside that was set apart for this purpose. Later in the morning they grazed on the second growth then at noon for a short while on the first growth before returning to sleep at the hillside. In the evening they were taken a third time to the first-growth and then back to the camp at dusk to sleep in a stone fold or in the center of the camp. Shepherds also conserved the most lush areas by grazing the more exposed parts of the estate, such as the south facing slopes, early in the season before they dried up (Tapper 1979c: 90-91).

Watson's ethnography of an Iranian agro-pastoral village details the daily movements of a shepherd in the hills. The animals were herded out from village along a well-beaten path. The animals did not eat anything initially on the way out along this track as it followed the river. After some distance, they were herded into a small tributary valley along the river that had a stream running down the bottom. The herd moved up this tributary valley while the shepherd positioned himself up on high slopes watching down. At 1:00 pm, the shepherd turned the herd around. The next day, he took the herd to a different place (Watson 1979: 98-104).

Several different groups practiced different spatial grazing patterns for young animals, goats, and sheep. For example, the Lurs herded yearling flocks further away from the camp and reserved pastures nearer the camp for the less mobile ewes, who for 5-6 months of the year either had to nurse their young or be milked at the campsite (Black-Michaud 1986: 48). The reverse was true of goats kept by transhumant shepherds on the Tauran Plain in northeastern Iran; young

kids were grazed near the camp, while older goats were marched some distance from the camp before they were allowed to begin grazing. Shepherds took into account the preferences of different classes of animals for certain plant species, as well as the speed at which these classes of animals liked to graze or browse (Nyerges 1980: 39-41). The different grazing habits and needs of sheep and goats led Bakhtiari shepherds to put sheep in a particular area first, followed by goats (Digard 2002: 73). The Shahsevan reserved lush tracts of first-growth vegetation in their summer pastures for animals that needed special care (Tapper 1979c: 90-91).

Contrary to the accusations of governments and landscape historians who associate erosion in the Mediterranean area with overgrazing (Goudie 1990: 53-54; Jameson, et al. 1994: 325; Thirgood 1981; van Andel, et al. 1997: 54-55; Vita-Finzi 1969), ethnographers emphasize the evolutionary ecology and conservation practices built into various herding strategies. For example, the Tauran plain shepherds followed a four-day cycle in their use of the four main grazing routes out of a summer camp in order to ensure that grazing pressure was equally distributed across the landscape (Nyerges 1980: 41).

Territoriality

Local aspects of pastoral nomadic territoriality are also particularly under-studied. Ethnographers have largely declined to look at issues such as the spacing between adjacent camps, the space between camps and villages, the nature of boundaries between pastures held by different groups (whether village-based or pastoral nomadic herders), and the material expression of these boundaries.

A major difficulty is that such boundaries were probably often unmarked or defined using natural features in the landscape. According to Tapper, in Shahsevan territories “boundaries of every pasture are common knowledge and may be marked by various natural or artificial features: rivers, canals, streams, gullies, hills, rocks, piles of stones or pits at regular intervals, ditches, paths or tracks” (1979a: 105). Boundary disputes tended to be most frequent at the end of the

extended stays in winter and summer pastures as resources became scarce. Disputes could also be frequent in the late spring, when the groups arriving first in highland pasture areas tried to sneak in some grazing time on other camping groups' pasture tracts (Beck 1991; Tapper 1979a: 106).

Among the Qashqā'i, pasture boundaries were also unmarked. The general boundaries of the entire winter and summer pasture areas allocated by the government were defined using the physical nature of the terrain and the use of adjacent territory by neighboring groups (Beck 1991: 79). Pasture boundaries between camps within the winter area were highly specific, but unmarked (Beck 1991: 123). In summer quarters, precise pasture boundaries between camps did not exist, and each camp used the slopes of the hills and mountains nearest them. Grazing at the highest altitudes in summer pastures was open to all pastoral nomadic households who held rights in the summer pasture area (Beck 1991: 295). Both winter and summer pastures were accessed by a limited number of routes, and the pastoral nomadic inhabitants kept track of people coming and going in the area. The headman of the Qermezi subtribe used lower-status households to guard his own camp and the points of access to their pasture areas (Beck 1991: 80). The Qashqā'i built huts, houses, and animal shelters in their seasonal pastures and also planted trees to help substantiate their claims to the land, however nearby sedentary villagers often destroyed the improvements made to springs and uprooted these trees in order to increase their own claims to the land (Beck 1991: 311).

Small tracts of unclaimed land sometimes separated the boundaries of pastures used by large, territorial tribal confederacies of western Iran. These tracts served as buffer zones that helped to reduce conflict between groups such as the Bakhtiari and the Lurs. In the twentieth century, these peripheral unclaimed lands were taken over by smaller tribes and tribal groups, such as the Torkashvand, that lacked sufficient pasture area and/or suitable and undisputed migratory routes (Ehlers 2002: 175).

Territorial boundaries may also be expressed in non-material ways, in particular through

ethnicity and kinship networks. A study of the Baluch pastoral nomads of western Pakistan found that their “macropastoral orbit”—the union of all of the territories they use—was a bounded entity in both social and geographic terms. In addition to being bounded by natural landscape features, the orbit’s edges were clearly defined by social networks that provided information on micro-environmental changes and social conditions, including pasture and water availability and the manpower requirements of certain camps. The spatial coincidence of this social network and the network of used pastures was clear. Although pastoral nomadic families were fairly well informed about areas within “their own” territory up to 50 miles away and separated from them by rugged mountain ridges, they had virtually no information on other adjacent grazing areas to the north and west that were considerably more accessible to them in terms of actual distance and geographical barriers but were inhabited by outsiders (Pastner 1971: 180-181).

Water Acquisition

Pastoral nomadic households must acquire water for both domestic and animal needs. Sometimes water for animal and human consumption came from the same source and sometimes from different sources if different water qualities were available. Ideally animals were herded directly to a water source, but in some cases water was also transported for them by pack animal back to the campsite. If animals and humans consumed water from the same source, efforts were made to ensure that the animals did not contaminate the supply for human consumption. While domestic water requirements remained fairly stable throughout the year, animal needs varied depending on the season, the moisture level in the grazed vegetation, and whether or not females were lactating (e.g., Horne 1994: 42)

Pastoral nomadic groups approached territoriality and access to water sources in two ways. Some, such as the horizontally transhumant Al-Murrah Bedouin of Arabia, recognized private rights to artificial water sources such as wells and cisterns (Cole 1975). Others, such as the Yomut Türkmen (Irons 1975), the Lurs (Black-Michaud 1986), and the Saçıkara Yörük

(Bates 1973), practiced a “first come, first served” rule in the use of artificial water sources (Tapper 1979c: 4). Generally, everyone was entitled access to natural, free-flowing water sources such as rivers and springs. Sometimes these public water sources (rivers, canals) were located within pastures held by certain groups or individuals. In these cases, Shahsevan households established paths to these water sources. Groups whose estates had direct access to water sources allowed their animals to drink from the source, but where other pasture estates intervened, the groups with indirect access carried water to their herds via camel train (Tapper 1979c: 87). Over several decades, securing reliable water access became a problem for tribes in Iran because of agricultural expansion and the lowering of water tables due to irrigation. In the 1960s and 1970s the Qashqā'i relied on seasonal natural water sources, lived near their pastures, and traveled to collect water. By the 1990s, they had to assert their right to water sources by living near the sources on a permanent basis. This caused them to need to travel farther and farther away for adequate grazing (Beck 1998: 62-63, 71-73).

In areas where there were no wells or rivers, run-off collection features were the primary sources of water in winter territories. The Qashqā'i excavated earthen water basins delimited by rocks and dried mud that collected rainwater and run-off for animal consumption and also made use of natural pools remaining in gorges after heavy precipitation (Beck 1991). Households used run-off that collected in rock crevasses for their own consumption (Amir-Moez 2002: 199). The Shahsevan dug wells in their winter pastures, which were subsequently held as private property. They also used the run-off that collected in natural hollows and artificial reservoirs. They piled snow in these hollows and reservoirs so that animals could drink the melt (Tapper 1979c).

In summer territories, springs and snow-melt were the primary sources of water. The Qashqā'i lined the mouths of springs with stones to create small pools and sometimes constructed channels with stones. These channels allowed animals to drink away from the spring head, and helped avoid contamination of the water for human consumption (Beck 1991: 295). The Shahsevan endeavored to ensure that snow melt did not escape their summer pastures. They

dammed flowing snow melt in reservoirs in order to water animals and also channeled snow melt onto hillsides in order to create irrigated meadows. Camps took water for domestic purposes from springs and not from stagnant pools of snow melt (Tapper 1979c: 90).

In both winter and summer territories, pastoral nomadic groups continually improved artificial water sources. The Qashqā'i repaired their winter run-off basins every year, eventually with concrete, and also annually repaired the channels that they constructed to divert spring water for animal consumption in summer pastures. They built no permanent structures in their summer pastures, and the only land improvements they engaged in were related to water sources (Beck 1991: 295).

Cairns

Cairn fields of both historical and modern origins must have been among the landscape features encountered by twentieth century pastoral groups in the Taurus and Zagros regions, but their presence, creation, and use is rarely mentioned by ethnographies. Some pastoral nomadic groups were engaged in ongoing processes of cairn creation as they added to stone piles marking particularly dangerous places on migration routes and other places of bad luck (Brooks 2002). Qashqā'i nomads added stones to piles at shrines (Beck 1991). In the 1960s, the Baluch and Brauhui in southeastern Iran erected cairns as monuments commemorating marriage ceremonies and funerals (Dales 1962; Lamberg-Karlovsky and Fitz 1987: 748; Lamberg-Karlovsky and Humphries 1968: 275).

Caves

The use of caves for animal and human shelter was common among pastoralists of the Taurus and Zagros areas. Among Shahsevan winter camps, each household or at least each herding unit maintained access to an underground cave that was used to jointly house animals and people in the coldest weather (Tapper 1979c: 85). Many, but not all Qashqā'i winter camps used natural caves to protect animals and to store straw and equipment year-round (Beck 1991: 78).

Kurdish agro-pastoralists in northern Iraq frequently housed themselves and their animals in limestone caves during the winter (Solecki 1979; 1998).

Pastoral Nomadic Landscapes According to Travelers' Accounts of the Diyarbakır Area

Nomadic encampments, rural lifestyles, and rural land-use feature peripherally in various accounts written by travelers to the Diyarbakır region over the last 200 years. While the information to be gleaned from these sources is typically anecdotal rather than scholarly and systematic, these accounts suggest that some of the ethnographic observations about local pastoral landscapes discussed above were valid for earlier periods or other groups. In particular, the travelers' accounts indicate that tent foundations and animal enclosures were constructed out of a wide variety of materials, that some pastoral nomad tribes cultivated land in the vicinity of their pasture areas, that encampments were strategically located for the purposes of defense and pasture usage, and that pastoralists repeatedly camped in the vicinity of landscape anchors such as cisterns and cave dwellings.

A wide variety of travelers described the black tents forming camps of Arabs, Kurds, and Türkmen pastoral nomad groups in southeastern Turkey, including their size, layout, use of reed screens, and different seasonal forms. (Badger 1852: 312; Buckingham 1827: 15-20, 153; Chesney 1850: 368; Childs 1917: 394, 404; Davis 1879: 201; Geary 1878: 228, 238, 251; Hills 1964: 160; Percy 1901; Stark 1959: 52; Wigram and Wigram 1914). Sometimes these camps were founded on the ruins of ancient sites and deserted villages (Buckingham 1827: 33; Wigram and Wigram 1914). Travelers sometimes distinguish between the black tents of the Yörük and Kurds and the felt tents with lattice-work frame apparently used by some Türkmen (Davis 1879: 201). Others found Türkmen, Yörük, and Kurdish groups using similar tents except in dimensions and number of poles (Chesney 1850: 368). Nomadic tribesmen often owned nearby

fields in which they cultivated grain part-time (Buckingham 1827: 20); this was true of Kurds in the Diyarbakır area in the 1870s (Davis 1879: 438).

Camping groups employed various types of structures for penning their animals. Pastoral nomad tribes in the areas between Urfa and Mardin in the early nineteenth century constructed stone enclosures (Buckingham 1827: 156). The tents of a campsite near Urfa were arranged in a fashion that created an enclosure in which all the animals (2000-3000 head) of the camping group were kept together (Geary 1878: 238). Caves and natural rock outcrops were frequently used to protect and pen sheep in the mountains south of Lake Van (Percy 1901: 130; Stark 1959: 48; Wigram and Wigram 1914).

The most vivid descriptions of landscape organization come from travelers who described the positioning of campsites with respect to available pastures and trade routes. A particularly landscape-oriented travel account from the 1950s describes summer tent camps constructed partially of reed fencing and arranged along streams, with sheep being sent to graze in pastures above (topographically higher than) the camps. Rock outcrops formed a type of natural pen in which the sheep slept, typically curled in rock crevices and guarded by dogs (Stark 1959: 47-52). Travelers' caravans in the nineteenth century often paid fees to nomads (Buckingham 1827: 150; Percy 1901) and their encampments were sometime located with an eye towards increasing their income from travelers. A Bedouin camp described by Buckingham had a very good location from the defensive point of view. Located midway between the routes to Mardin and Diyarbakır from Urfa, it was an ideal base from which to monitor each of these roads. The location also contained a natural spring, pasture, and a high, steep hill that served as a lookout post and place of security. The flocks were kept on the hill at night in corrals, and the tents were pitched on a part of the hill, which made them "as secure as the most regularly fortified garrison" (Buckingham 1827: 145-146, 156). More generally, Buckingham describes the camping pattern of the Beni-Melan tribe in the area between the southern road from Urfa to Mardin and the northern road from Urfa to Diyarbakır. This area supported approximately 500

tents, pitched in groups of 30-50 households tending sheep, goat, and cattle. The nomads buried their dead at the base of hills and erected large gravestones. Their corrals were typically constructed on hills for security purposes (Buckingham 1827: 157-160).

The landscapes surrounding campsites in southeastern Anatolia frequently contained cisterns and cave dwellings. Davis noted that the Yörük near Tarsus were only able to obtain water from deep rock-cut cisterns (Davis 1879: 437). Türkmen encampments west of Urfa drew water from large circular cisterns up to 20 feet deep with steps (Buckingham 1827: 45-46), and an encampment between Urfa and Mardin drew upon “very deep” cisterns hewn out of hard rock with carved surface channels for directing rainwater and surface water into their tanks (Buckingham 1827: 143). For the east end of the Upper Tigris River Valley and the Hirbemerdon tepe study area, the most interesting account is that of Badger. While studying Nestorian Christians in 1849-50, he noted the use of rock-cut cisterns for winter rain collection near Midyat and throughout the Tur Abdin mountains and observed the inhabitation of several subterranean cave villages and houses built overtop of caves in the northern part of the Tur Abdin Mountains between Midyat and the Upper Tigris area (Badger 1852: 52-54).

Conclusions: Landscape Anchors, Landscape Capital, and Historical Ecology

The above synthesis of available ethnographic data on Turkish and Iranian pastoral nomadic and agropastoral groups in the Taurus-Zagros Mountain arc provides a basic set of data that will be used to interpret the pastoral features surveyed around Hirbemerdon Tepe. Most of the studies that generated these datasets took place in the 1950s-1970s, focused on kinship patterns and/or the relationship between tribes and state governments, and did not concentrate their analyses on local-scale land-use patterns. An alternative, local landscape approach to pastoral communities is illustrated ethnographically through studies on the local identity and place-making practices of sheep herders in the Scottish borderlands and in the New Zealand high

country. Using these ethnographies as models illustrating the scale and types of features necessary for reconstructing the daily movements of pastoral nomads, the archaeological survey of pastoral landscapes near Hirbermedon Tepe documents the historically-specific activities and practices that both occurred within and generated the local landscapes surrounding campsites. A number of the Iranian and Turkish ethnographies contain information relevant to material reconstruction of local pastoral nomadic landscapes, especially Richard Tapper's studies of the Shahsevan tribe of northwestern Iran.

One of the most significant conclusions drawn from this synthesis of Iranian and Turkish ethnographic data is that pastoral nomadic communities in the Middle East transformed aspects of their local environment. Pastoral nomadic communities invested considerable effort in constructing fixed shelters such as corrals, caves, and shacks and considerable effort in landscape features such as cisterns, basins/reservoirs, water channels, dams, wells, and cairns. Such features were designed to improve the herding potential of the local area by protecting humans and animals and enhancing the quality or quantity of water and pasture. Pastoral communities returned to campsites associated with these features year after year and maintained or seasonally restored them. The features helped substantiate groups' claims to certain pasture territories, marked their movements through the landscape, and marked the sites of daily herding and domestic activities. Drawing on the ethnographies of Scottish and New Zealander sheep herding groups, it seems likely that sets of landscape features cumulatively formed pastoral senses of place and marked pastoralists' detailed seasonal knowledge of local geography.

Over time fixed campsite and landscape structures can be best understood as landscape anchors: features that are in continuous and modified use. These geographical foci should come to orient groups' camping, herding, and mobility patterns over long periods of time. Knowledge and memory of such "landscape anchors" should play a role in how and why mobile people return to certain locales.

Due to their repetitive seasonal use of land, pastoral nomads had a complicated relationship with the investments they and their neighbors made in the landscape. The ethnographic datasets presented above clearly show that pastoral nomadic groups created and seasonally curated their own landscape anchors. However, their seasonal absences in a particular territory placed limits on the effort they were willing to invest in landscape features, which could have been removed or destroyed while they were away. Nearby villagers destroyed the trees and spring channels that the Qashqā'i planted and constructed in their summer pastures because they "abhorred any physical sign that the Qermezi claimed the land" (Beck 1991: 311). The Shahsevan used cane to construct fences and screens that were not carried with them on migration. Rather than leaving these cane constructions as a permanent feature at their winter campsites, they burned them in the spring for fuel because otherwise the nearby villagers would come in the summer and steal them (Tapper 1979c: 86). On the other hand, pastoral nomadic groups frequently benefited from the landscape capital of other groups. The Beritanlı used tell sites and the ruins of abandoned sedentary villages to protect their winter campsites and provide shelter (Skogseid 1993: 226). Irrigation systems in Iran provided water access and more lush wild vegetation at field edges for animal herds (Beck 1998). Finally, pastoral nomadic groups also contend with the landscape capital of sedentary societies that in the twentieth century completely enclosed them. Each year Iranian cultivators improved their land by increasing the size of their fields, constructing better irrigation channels, field walls, and field shelters. Such investments fortified their claim to the territory and made it less likely that pastoral nomads would retain physical control or political rights to the land (Beck 1991: 297).

The following chapters seek to identify similar interventions in the landscape by pre-modern pastoral nomads and to present evidence that these interventions were durable landscape anchors that conditioned subsequent use of the landscape.

CHAPTER 3: GEOGRAPHY AND ENVIRONMENT OF AGRICULTURAL AND PASTORAL LANDSCAPES IN THE UPPER TIGRIS REGION

Introduction

This chapter describes a study area selected to obtain detailed data on pastoral nomadic inhabitation sites and landscapes over the last 500 years. It begins with a geographic, topographic, climatic, and ecological description of mountain-river plain systems in southeastern Turkey, the Upper Tigris River Valley and the Tur Abdin Mountains, and finally the Hirbemerdon Tepe Survey (HMTS) area situated at the interface between the river valley and the Tur Abdin. The survey area itself has historically been quite isolated, as it is significantly removed from the major historical travel routes through the region. Environmental change over the last several hundred years appears to have been negligible. Recent land-use patterns, particularly the mechanization and spatial extension of agriculture, have had significant effects on the preservation of the archaeological record. Multispectral satellite imagery, digital elevation models, and historical documents are used to model potential pastoral nomadic migration routes and describe distances and elevation changes associated with these routes.

Regional Context

Pastoral nomadism is a human activity carried out over a regional scale. Vertically transhumant pastoralists can range in a single year over lowland plains, foothills, and high mountain areas. Thus, while the HTMS encompassed 47 square kilometers in southeastern Diyarbakır province and additional satellite imagery work covered an area of 440 square kilometers to the east of the survey area in Mardin and Batman provinces, the region that must be considered within a landscape archaeology framework encompasses thousands of square kilometers from the northern Mesopotamian plains in Syria to the high passes of the Taurus

mountains in Anatolia. To draw on the discussion of scales of movement from Chapter 1, it is important to consider not only the immediate catchment areas associated with local movement, but also the series of catchments utilized throughout the annual transhumance cycle during the course of inhabiting a series of camp or seasonal village sites. Although the primary goal of the archaeological research is to examine the local pastoral landscapes surrounding campsites, it is important to place these campsites and local landscapes within the regional land-use system.

Broad Region Relevant to Vertical Transhumance Cycles

The region relevant to vertical pastoral nomadic transhumance cycles in southeastern Anatolia stretches from northern Syria to east-central Turkey (Figure 3.1). The major structural geological elements forming the ranges of the Taurus Mountains and the plains of northern Mesopotamia are the southern Anatolian folded zone and the Arabian platform (Dewdney 1971: 84-85; Ilhan 1971: 165-166). The Taurus ranges are the result of uplift from the collision of the Eurasian and Arabian plates, a process that began 12 million years ago and continues today (Nicoll 2010: 408). The main trend lines of the fold ranges curve around the northern edge of the Arabian platform, forming a mountainous arc commonly known as the southern arm of the Anti-Taurus mountains (Zohary 1973: 13). These ranges are highest at the northern edge of the folded zone and are broken by the sharply incised valleys of the Tigris and Euphrates rivers and their tributaries. Valleys in the ranges consist of downfaulted flat-floored basins covered with Neogene sediments. Extensive plains, which have developed on Neogene deposits 400-700 meters above sea level, lie south of this arc, on the stable massif of the Arabian platform around the cities of Diyarbakır and Urfa. These plains are separated by low hills of Eocene material, the most extensive of which are the Tur Abdin Mountains (Dewdney 1971: 87-88). The Karacadağ, an area of recent volcanics rising to a height of 2000 meters above sea level (Bridgland, et al. 2007), dramatically separates the Upper Tigris Plain surrounding Diyarbakır in the northeast from

the Harran Plain surrounding Urfa in the southwest, though there are corridors linking the two (Zohary 1973: 181).

The Tigris and Euphrates rivers dominate the entire region hydrologically. The Euphrates drains the northern, higher portion of the eastern Taurus, while the Tigris drains the southern, lower portion. The plains surrounding Diyarbakır and Urfa, enclosed by these two great rivers, are in geographical and vegetational senses an extension of northern Mesopotamia (Zohary 1973: 181). Below the Karacadağ and the Tur Abdin, these plains extend into the “Jazira” of Syria and Iraq, sloping gradually downwards into the fertile areas of the Balikh and Khabur River Basins and eventually to the Euphrates in the midst of the Syrian desert.

The geographical centerpoint of the broad region surrounding the HMTS area is the Tigris River. The Tigris rises from snowmelt and karstic springs at an elevation of 1530 meters above sea level in the Bitlis suture zone near Lake Hazar and Elazığ, the current boundary between the Arabian and Eurasian plates. Near the river’s sources in the Eurasian plate, the primary lithologies are pre-Neogene limestones, ophiolitic mélanges, and metamorphic rocks (Doğan 2005: 76). After crossing into the Arabian platform north of Diyarbakır, the river cuts an approximately 70-meter-deep gorge in basalts related to eruptions of the Karacadağ (Bridgland, et al. 2007: 387). Further downstream, the Tigris and its tributaries flow in marine sediments consisting of Lower Miocene limestones, sandstone, and silt, and Upper Miocene-Pliocene terrestrial conglomerate, clay, and silt (Doğan 2005: 76; Economist Intelligence Unit Limited and Cartographic Department of the Clarendon Press 1960: 18).

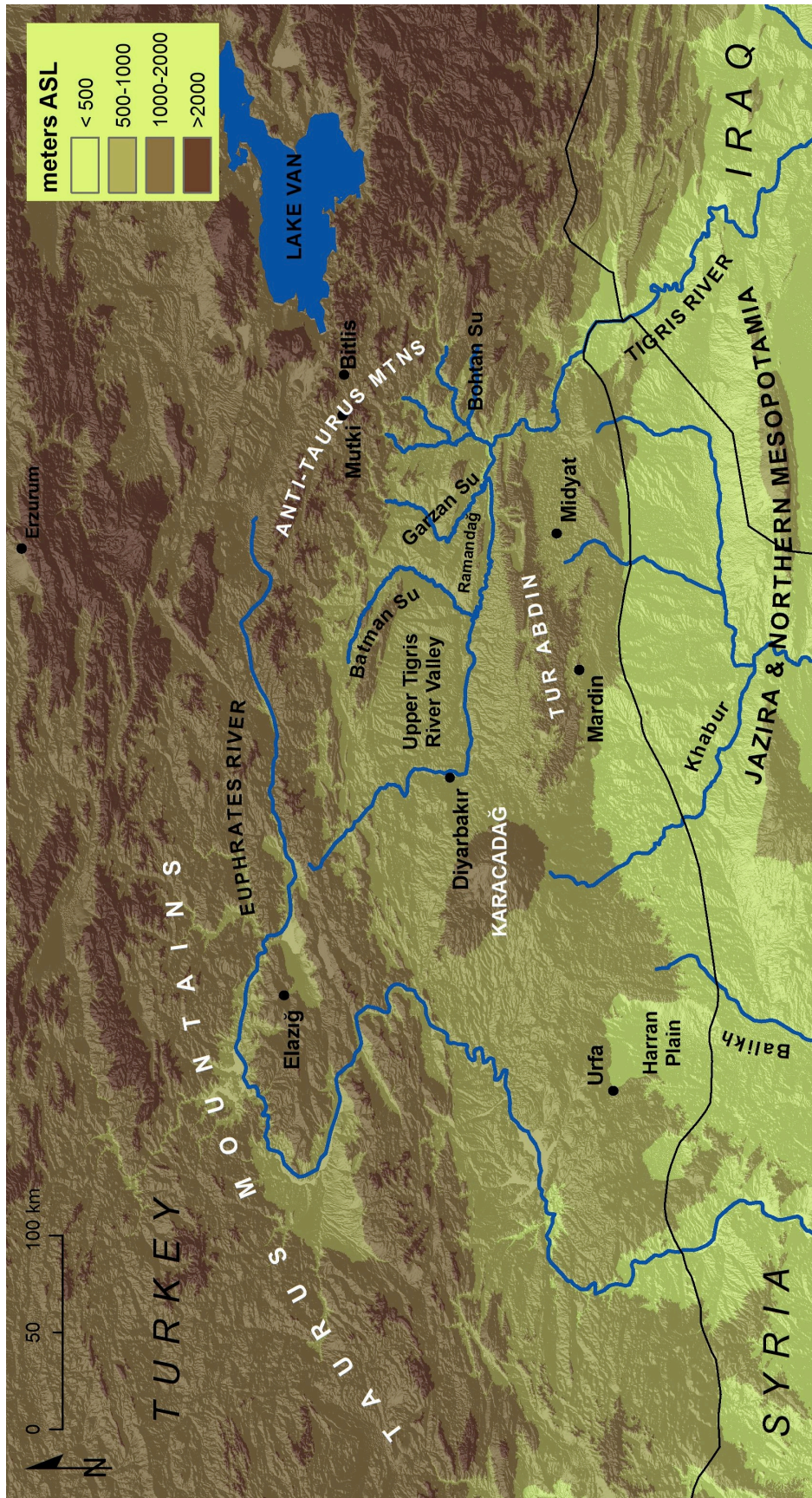


Figure 3.1: Geological and topographic features of southeastern Anatolia and northern Mesopotamia.

Upper Tigris Region

The Upper Tigris River Valley is the eastern-most of the broad plains immediately south of the eastern Taurus arc, and thus forms the northeastern edge of northern Mesopotamia. The area is approximately 120 kilometers west-east and 70 kilometers north-south at its greatest extent and consists of undulating low relief steppe of broad plateaus at 510-530 meters above sea level interspersed with hills up to 600 meters above sea level. Unlike the plains surrounding Urfa, which continue unbroken into Syria, the Tur Abdin Mountains separate the Upper Tigris River Valley from the Jazira of northern Syria and Iraq. The Upper Tigris River Valley is defined on all sides by upland areas: to the south and southeast by the Tur Abdin Mountains, to the north and northeast by the Taurus and Anti-Taurus Mountains, and to the southwest by the Karacadağ.

The river follows a course that exploits lithologic weaknesses in the bedrock. It enters the plain on a north-south course. Just downstream from Diyarbakır, the river has been forced by the Karacadağ and the folded Mardin block to flow west-east for approximately 140 kilometers. Along the first 70 kilometers of this stretch, the river has formed a broad alluvial valley in which it follows a curved, meandering course. Most of the Tigris tributaries flow in a north-south direction, intersecting the fold systems at nearly right angles (Tolun, et al. 1962: 35-36).

The Turkish portion of the upper Tigris has three major tributaries: the Batman Su, the Garzan Su, and the Bohtan Su. The Batman Su has its origin in the southern flanks of the Anti-Taurus Mountains near Bitlis to the northeast of the plain, and its lower reaches form the eastern-most extension of the Upper Tigris River Valley. At its confluence with the Tigris west of the Ramandağ anticline, the Batman Su carries more water than its confluent. The Garzan Su rises in the plateau of Mutki and Hoyt and joins the Tigris east of the Ramandağ anticline. The Bohtan Su drains water from the high mountains south of Lake Van and flows into the Tigris at the point where the Tigris ends its west-east course and again turns south towards northern Iraq. Like the Batman Su, the Bohtan Su carries more water than the Tigris at their point of confluence.

Tributary streams in the Taurus and Anti-Taurus Mountains that are fed by snow melt and that

run down from high peaks frequently have a torrential flow. As these flows easily erode the limestone geology of the region, the hydrological system has formed a network of young, narrow, deep valleys. The Garzan Su, Bohtan Su, and the Tigris immediately downstream from its confluence with the Batman Su all cut deep canyons in plateaus formed by the Midyat limestone formation (Tolun, et al. 1962: 34-36).

In recent years, several geomorphologists have investigated the Quaternary incision history of the Tigris with the goal of examining the relationship between river dynamics, valley environment, climate change and human settlement (Bridgland, et al. 2007; Doğan 2005; Kuzucuoğlu 2002; Nicoll 2010; Parker, et al. 2009). This work confirms that the Tigris has been flowing in the same bed since the Neolithic period (Doğan 2005: 85). However, the river appears to have experienced significant changes in base flow through time. These dynamics are related to annual and seasonal fluctuations in precipitation either in the Tigris's upper reaches or the local drainage area as well as vegetation cover/other factors controlling water and sediment load in the regional and immediate watersheds (Kuzucuoğlu 2002: 769).

Geological survey indicates that the modern Tigris is underfit, meaning that the water load is under system capacity. The discrepancy between modern and pre-modern flows is apparent in the difference between current water level and bank height. Today there is a high degree of water extraction for the purposes of diesel-pump irrigation and livestock maintenance. Base flow may have been higher in the past not only because irrigation, agriculture, and animal husbandry were less intensive without the aid of modern machinery, but also because of more precipitation, lower evaporation rates, and enhanced input from tributaries (Parker, et al. 2009: 87).

Other characteristics of the river have also changed through time as a result of these changes in flow. Today the Upper Tigris is braided in areas, incised through gravel bars. These gravel bars were deposited during times when the river flowed at higher stages, and probably did not exist in antiquity, when the river was higher and deeper. The reduced water level and

existence of these gravel bars means that the modern Tigris is fordable in many locations in summer. It is not uncommon to see tractors driven through the river and occasionally herds of cows. This too would have been impossible in the past with elevated base flow (Parker, et al. 2009: 87). An early twentieth-century traveler in the region found the Tigris generally unfordable (Sykes 1908: 463).

Geoarchaeological work in the vicinity of Bismil has investigated the system of alluvial terraces forming the side slopes of the Tigris River valley (Figure 3.2). The first opening level of the river is evidenced by a terrace step with alluvial fills at +40 m above the current floodplain (T1). Below this there are four more terrace steps at +30-35 meters (T2), +10-9 meters (T3), +4-5 meters (T4) and +2-3 meters (T5). T1-T3 are Pleistocene in date, while T4 and T5 are Holocene in date and embedded in T3 (Doğan 2005: 76; Kuzucuoğlu 2002: 767-768). Not all of these terraces are continuously present. T4 is the largest and most continuous in the valley, forming low flat areas on which current villages are located and irrigation agriculture is carried out. On the basis of archaeological data, specifically flood deposits within site excavations and the location of dated sites, it can be concluded that T4 formed after 10500 BC and T5 formed after the Bronze Age. The T3 and T4 floodplain terraces have been merged by erosion relating to agriculture and irrigation activities, and there are no definite boundaries between the two terraces in many parts of the valley (Doğan 2005: 78-79). Several large flooding events since the Chalcolithic period have removed portions of archaeological sites located on the T4. Silt deposits at the cemetery of Aşağı Salat east of Bismil indicate that major floods have occurred between the Medieval period and today, the most recent of these in 1970 (Doğan 2005: 81-83)

An integration of archaeological excavation data and the above geological observations suggests several more specific conclusions about the relationship between flood plain morphology and human settlement. During the Late Neolithic (6000-5500 BC), Chalcolithic (5500-3000 BC), and Early Bronze (3000-2650 BC) Ages, settlements were founded on the partially formed T4 at relative altitudes of 2 meters for Late Neolithic and 3-3.5 meters for Late

Chalcolithic and Early Bronze Age settlements. Early Chalcolithic settlements are not located near the river, suggesting that flooding occurred at this time as well. At the end of the Early Bronze Age, floods occurred that had significant enough volume and strength to erode mounds of earlier periods, including Kavuşan Höyük, Hakemi Use, Aşağı Salat, and Müsulman Tepe. From the Early Bronze Age until the Late Bronze Age or Early Iron Age, sites are only found on the higher T2 and T3, rather than in the valley bottom as in the preceding periods. This presumably indicates that the T4 was inhabitable 2650-1200 BC due to flooding. From 1200 BC onward the flood plain has generally been inhabitable as the river took on a more incising and meandering characteristic that has resulted in the formation of T5 (Doğan 2005: 84-85; Kuzucuoğlu 2002: 769).

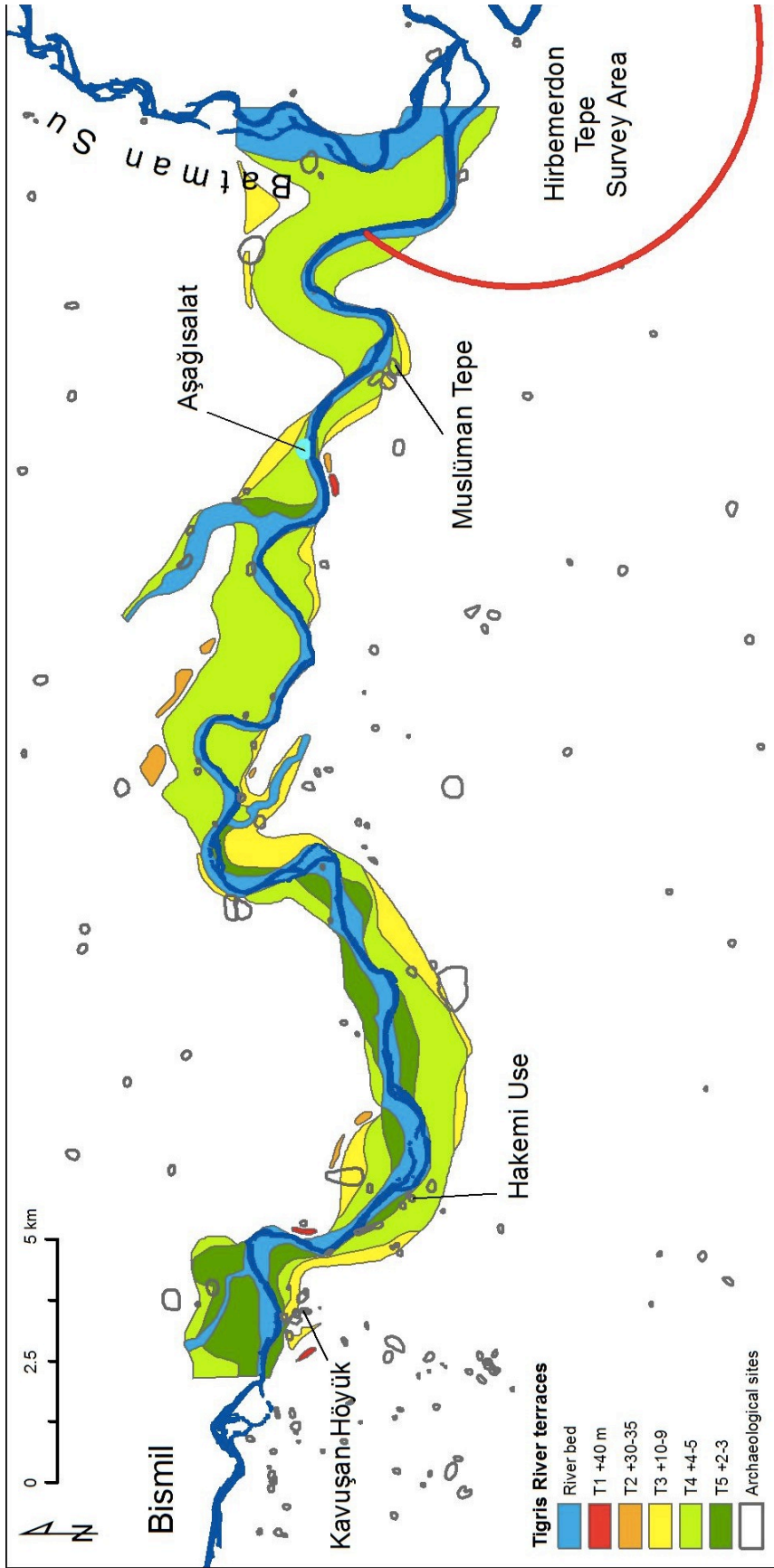


Figure 3.2: Alluvial terraces forming the slopes of the Upper Tigris River Valley between Bismil and the Batman Su. After Doğan 2005.

Climate and Vegetation

The entire southeastern Anatolian region has a seasonal continental Mediterranean climate. This is characterized by a rainy winter/spring and severely hot, dry summers (Türkeş, et al. 2002: 61-62). The main circulation features determining precipitation in this region are westerly winds from the Mediterranean branch of the jetstream (Bryson and Bryson 1999: 5). In the winter, the lack of topographical barriers south of the Alps allows the subtropical jet stream to direct Atlantic low-pressure cells as far eastward as Afghanistan. The waters of the Mediterranean Sea provide a secondary source from which storms may maintain or renew their strength. In the summer, this wind belt migrates northward, and the subtropical high-pressure area causes warm and dry conditions to prevail (Roberts and Wright 1993: 194). Recent work on the persistence and periodicity of rainfall in Turkey has determined that there are biennial oscillations and longer cycles in both winter and summer rain variation in southeastern Anatolia (Türkeş, et al. 2002). These oscillations are important to consider, as they affect the quality and quantity of available pasture.

Within southeastern Anatolia, there are significant variations in climate and rainfall between higher mountain areas and more low-lying plain or steppe areas (Figure 3.3). The high mountains of the Taurus are the most humid parts of the region. The area around Bingöl, Muş, and Bitlis receives on average 720-970 mm centimeters of precipitation annually, mostly in the form of snow between the months of October and April. The lower foothills and plains are considered semi-arid and experience a more pronounced summer drought. The Upper Tigris River Valley receives 500-600 mm mean annual rainfall (FAO 2000). Moisture arrives chiefly in the form of rainfall November-April, but is inter-annually highly variable. Typically little rain, if any at all, falls in the months from June to September. Hydrothermic curves for both areas show the almost complete lack of summer rains (Zohary 1973: 32-33).

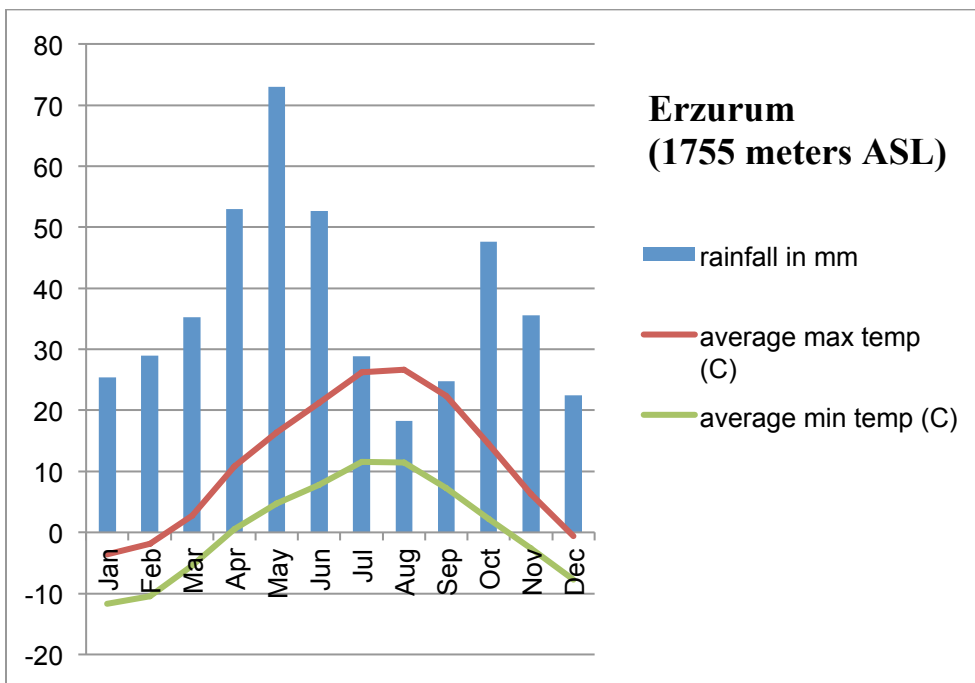
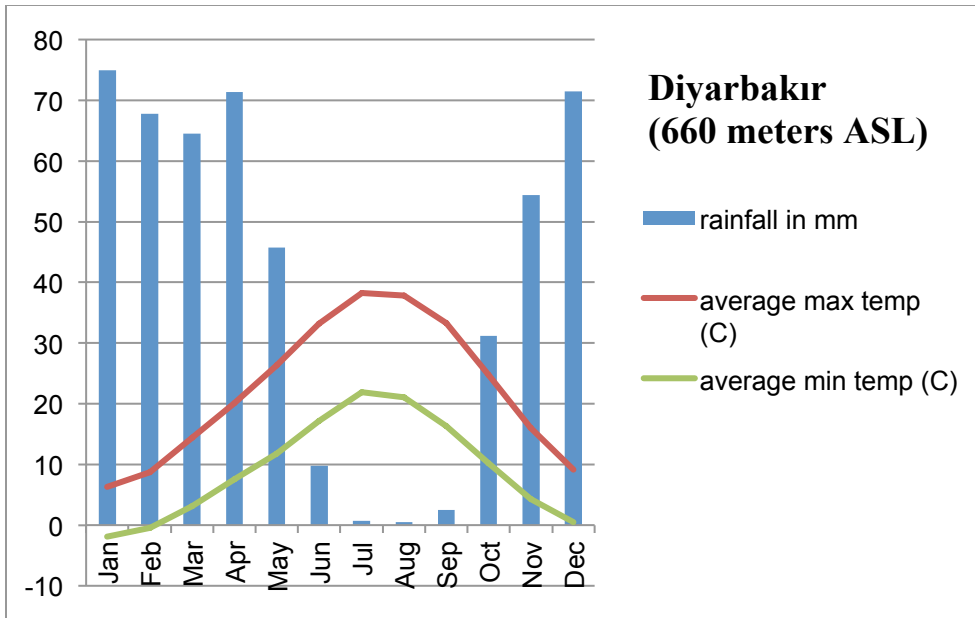


Figure 3.3: Average rainfall, minimum temperature, and maximum temperature for Diyarbakır in the Upper Tigris River Plain and Erzurum in the mountains of central eastern Turkey. Rainfall averages compiled from 737 months between 1929 and 1990; temperature averages compiled from 360 months between 1961 and 1990. Source: The Global Historical Climatology Network, via worldclimate.com.

Steppe forest vegetation characterizes the plains around Diyarbakır and Urfa. More specifically, the natural vegetation is classified as wormwood steppe forest of the *Artemisieta herbae-albae mesopotamica* (Zohary 1973: 181, 391-393, 473, map 7). The Tur Abdin and the Taurus mountains support oro-Mediterranean type forest varied in composition and density (Roberts and Wright 1993: 195). More specifically, the natural vegetation is classified as Xerophilous deciduous (oak) steppe-forest of the *Quercetea brantii* (Zohary 1973: 181, 353-365, 582-583, map 7). In the area between Diyarbakır and Mardin, however, the natural vegetation has largely been removed for the purposes of extensive dry-farming. Scattered *Quercus* and *Pistacia* trees left for shade are the only remaining natural vegetation in some areas (Zohary 1973: 583). The landscape appears to have been treeless for some time, as there is only one reference to woodlands in the northern part of Diyarbakır province in the sixteenth century Ottoman records (İlhan 2000: 46). The seventeenth century traveler Evliya Çelebi described a wasteland of stony soils between Diyarbakır and Mardin (van Bruinessen and Boeschoten 1988b: 193, 195).

Soils of the plain are brown earths of Mediterranean dry forests, intermixed with humus-carbonate soils. Further south, the Tur Abdin and Syrian plains have chestnut dry steppe soils that can be very fertile under irrigation (Economist Intelligence Unit Limited and Cartographic Department of the Clarendon Press 1960: 25).

The vast majority of climate studies examine change over chronological and geographical scales that are too broad to be of use for archaeologists, especially archaeologists concerned with recent historical periods. Palynological and lake level data can only be used to make broad generalizations over millions of square kilometers over several millennia—a spatial and temporal resolution inappropriate for understanding the cultural dynamics of a specific region, especially in mountainous terrain. A macrophysical archaeoclimatic method has modeled past climate on a local scale in Anatolia on the basis of the modeled past positions of major atmospheric circulation features (Bryson and Bryson 1999). This study predicts the difference between modeled mean

annual precipitation and observed modern values for Turkey at a ca. 100-kilometer spatial resolution at 200 and 1400 A.D. According to the resulting maps, the area around Diyarbakır may have been significantly wetter 1800 years ago, receiving between 8 and 10% more annual precipitation (40-60 mm additional rain per year). At 1400 AD, the modeled annual mean precipitation in the Diyarbakır region was within 2-4% of the observed modern values (Bryson and Bryson 1999: 13).

The conclusions of the new archaeoclimatic model—that the climate of northern Mesopotamia over the last several hundred years has been quite close to that of the present—agree with data that archaeologists and historians have drawn on for years. Before 1942-3, an investigation of hundreds of Anatolian tree rings by Gustav Gassner and Fritz Christiansen-Weniger demonstrated that no major changes had occurred during the previous few centuries in climate (reported in Hüttheroth 2006: 22). All of the known climatic oscillations were within the range of long-term averages for the last three millennia. Further, the geographic spread of several cultigens sensitive to climatic change has not noticeably shifted. Archaeologists working on the Near East have frequently taken for granted that "no major changes of climate [have occurred] since Assyrian times" (Hüttheroth 2006: 22).

Land-use

Description of the natural environment of the study area must include a review of recent historical land-use for several reasons. First, several of the sites studied are ethnoarchaeological (created or used within the memory of local villagers), and recent land-use patterns are important for considering the political, economic, and social contexts in which the occupants of these sites lived. Second, recent land-use patterns will have resulted in the preservation of some archaeological sites and the destruction of others. Thus, particularly in the context of a landscape study, it is important to discuss the human and natural processes that have shaped the current archaeological record. Third, the exact timing of agriculture modernization in the Upper Tigris

region is important for assessing how representative historical satellite imagery from the late 1960s (CORONA) might be of agricultural conditions and pasture extent in the period before modernization. Finally, an understanding of current land-use is important for understanding the obstacles limiting archaeological survey methodology.

Ethnographies (Bates 1973; Eberhard 1953; Erhan 1992; Hütteroth 1959) and village inventories undertaken by the Turkish Republic (İskân Plânlama Dairesi Başkanlığı 1966a; b; c) provide a picture of twentieth century agropastoral land-use in southeastern Turkey. The ethnographies were discussed in detail in Chapter 2 and the village inventories will be drawn upon below. The general pattern consisted of dry cereal farming on the broad lowland plains, limited irrigation gardening within the river valleys, and transhumant pastoralism making use of both lowland plains and high mountain pastures. Some pastoralists practiced limited cereal farming in their mountain pastures (Bates 1973; Hütteroth 1959). Vineyards have been common in the Tur Abdin mountains for centuries (Palmer 1990: 107-109).

As discussed in Chapter 2, extreme seasonal variations in environmental conditions, particularly the availability of pasture and water, motivate a vertically transhumant lifestyle in mountainous areas. In the semi-arid areas within the Taurus-Zagros arc, upland grasslands are under snow for five or more months in the winter, but become accessible and lush in the spring/summer after the snow has melted. Lowland valley steppe grasslands south of the mountains are plentiful in the winter but dried out in the summer due to extreme heat and drought. Nomadism may also be a political, social, and economic adaptation designed to exploit markets along migration routes, enable the health of certain strains of sheep, and evade governmental control through continual movement. However, the continuity of nomadic lifeways in the Taurus-Zagros arc over thousands of years is largely due to the climatic and environmental factors discussed in this chapter.

Agricultural groups also inhabit the lowland valley steppe grasslands used by vertically transhumant pastoral nomads. Current agricultural cultigens in the Upper Tigris River Valley

include wheat, barley, corn, cotton, sunflower, tobacco, potato, vegetables, and melons. All of these crops besides the first three require intensive irrigation. Cereals and pulses clearly have a long history of cultivation in this region; the Middle Bronze Age levels at the site of Hirbemerdon Tepe include traces of barley, emmer wheat, lentils, and grape (Laneri, et al. 2008: 194-195). Prior to the completion of hydroelectric dams feeding massive irrigation networks, grains, lentils, and to a limited extent, cotton, were the main cultigens across the southeast (Aksit and Akcay 1997: 535). Fields are typically utilized in a one year plant, one year fallow rotation (İşkân Plânlama Dairesi Başkanlığı 1966a: 47).

The preservation of archaeological and ethnoarchaeological sites in the Upper Tigris River Valley as well as the availability of lowland pastures have been shaped by modern agricultural activities. Though pre-twentieth century agricultural activities were undoubtedly destructive for archaeological sites, particularly ephemeral sites such as those inhabited by pastoral nomads, documenting and analyzing the patterning of archaeological sites in this region relies most heavily on understanding the modernization of agriculture in the valley.

Modernization has several dimensions that affect to archaeological site preservation and pasture availability. Mechanization involves the use of mechanical farming implements and pump irrigation schemes. Tractors and steel plows enable soil to be more effectively and deeply tilled, increasing the likelihood that archaeological strata will be disturbed. Simple gravity-flow irrigation fed by springs and rivers has probably existed in the Upper Tigris region since at least the Iron Age. Because the Tigris is so deeply incised in many areas, its water could not be tapped for gravity irrigation in much of the area. Thus, the development of diesel water pumps vastly expanded the irrigable area in this region. Mechanization and diesel-pump irrigation enabled expansion of cultivation into areas that were previously too steep to be ploughed, unsuitable for simple gravity-flow irrigation, or beyond the labor capacity of the local populace. This includes expansion into areas that would have formerly been given over to open pastureland.

Given that pastoral nomads wintering in the Upper Tigris in the last 500 years would have inhabited and grazed areas along the spatial limit of pre-modern agriculture, it is likely that many of their camping areas will have fallen victim to destruction by mechanized agriculture. This ongoing process was visible in the Hirbemerdon Tepe area during the course of the archaeological survey seasons. One of the surveyed archaeological campsites in the eastern, upland part of the survey area was intact in 2008. By 2009, this campsite had been partially dismantled by the small-scale agricultural fields that sedentary farmers are beginning to create in the upland area due to a lack of space on the more fertile river plain (Figure 3.4).

Accurately assessing the timing of agricultural modernization in the Upper Tigris area is necessary to determine how representative historical satellite imagery from the late 1960s (CORONA) might be of possible agricultural conditions and pasture extent in the period before modernization. National agricultural planning by the Turkish Republic began in the years 1961-1963 with the goals of encouraging the expansion and intensification of both dry and irrigation agriculture (Beeley 1985: 294; NESAP 1968: 94). According to national statistics, however, the spatial expansion of agriculture mostly occurred prior to 1960. From 1960 to 1980, agricultural yields were increased as much a two-fold in some areas through improved yields, but the area under plough increased only 7% (Beeley 1985: 291-292). Despite claims that the major expansion of agriculture was fairly evenly spread across the country by regional planning (Beeley 1985: 294), these national data may not accurately reflect the situation at the eastern end of the Upper Tigris River Valley, which is geographically remote in comparison to other regions of agricultural expansion in Turkey and which has supported a population of ethnic and religious groups that are minorities within the modern Turkish state.

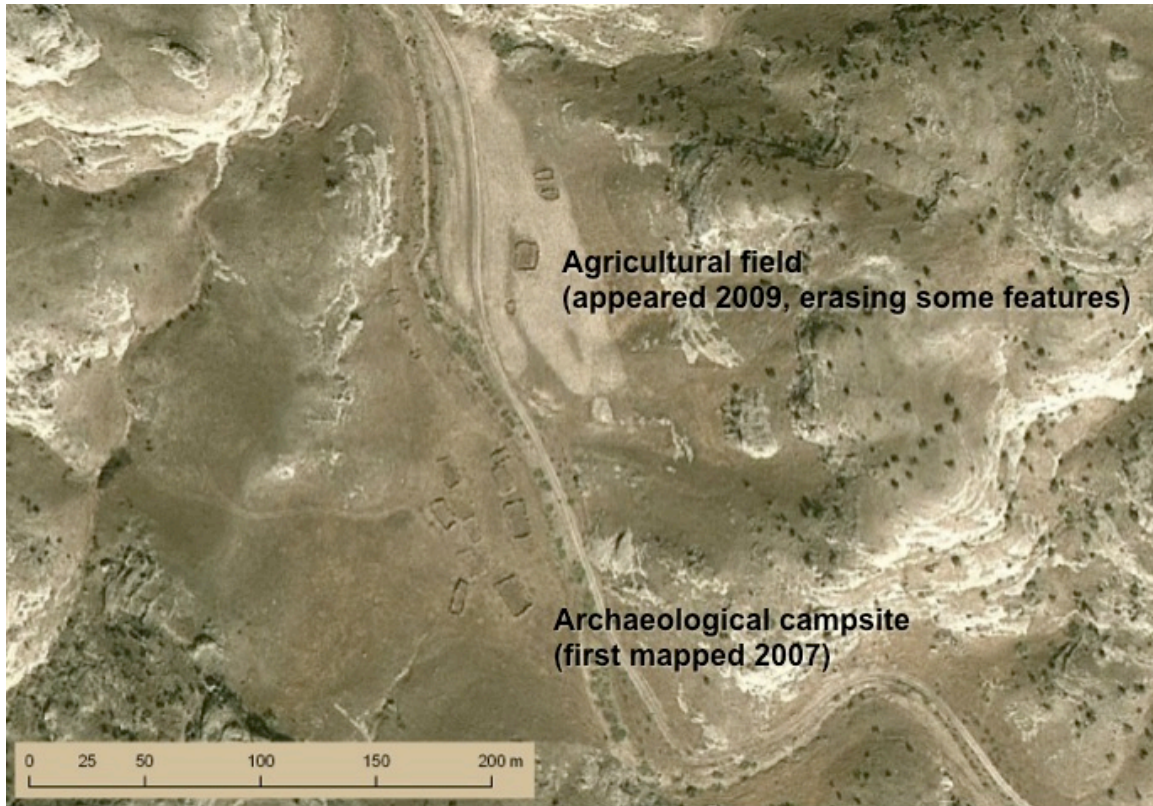


Figure 3.4: Destruction of archaeological campsites by modern agriculture within the Hirbmerdon Tepe study region. Base imagery is from Google Earth.

Village inventories carried out by the Turkish Republic in the 1950s and 1960s for the purposes of evaluating the agriculture and irrigable potential of the land spatially track the advance of modern agriculture in the Upper Tigris region. Drawing information from these surveys on the eastern end of the Upper Tigris River Valley is complicated by the fact that portions of the valley fell within the separately surveyed administrative realms of Diyarbakır, Mardin, and Siirt provinces. The high degree of topographic variability in all three of these provinces makes it likely that overall averages from each of these provinces would have been inaccurate for the eastern end of the Upper Tigris River Valley. It is thus necessary to rely on information gathered specifically for the Bismil (Diyarbakır province), Batman (Siirt province), and Midyat (Mardin province) ilçeler or subdistricts (Figure 3.1).

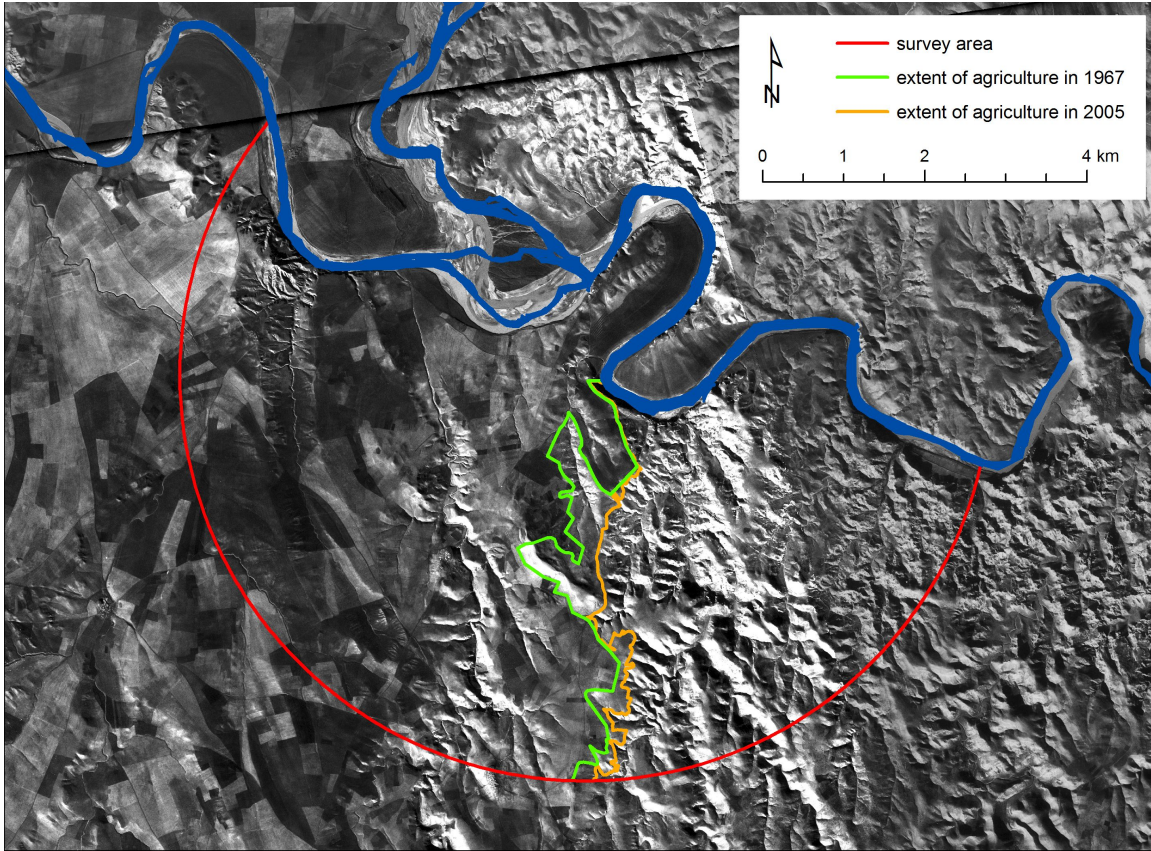


Figure 3.5: Eastern boundary of agriculture in the Hirbemerdon Tepe study region in 1967 and 2005, mapped from CORONA and IKONOS imagery, respectively. Base imagery is from a CORONA scene.

Based on the available modernization information, CORONA imagery of the late 1960s may be somewhat representative of what was possible agriculturally under pre-modern conditions (Figure 3.5). The data on Bismil, Batman, and Midyat subdistricts indicate that farming techniques were still rather primitive in the early 1960s, with most farms still using wooden ploughs. Most villages in all three provinces were not yet engaged in irrigation agriculture. The limited amount of irrigation was from springs and gravity-flow canals; pump irrigation appears to have been very limited (İskân Plânlama Dairesi Başkanlığı 1966a: 47, 78-79, 117; 1966b: 72; 1966c: 80-81). Overall, Diyarbakır, Mardin, and Siirt provinces had very few farms employing tractors, but the highest numbers of tractors were found in Bismil, Batman, and Midyat subdistricts, as these are among the most agriculturally favorable (İskân Plânlama Dairesi

Başkanlığı 1966a: 52-53; 1966b: 52; 1966c: 54-55, 126). A substantial increase in the usage of tractors and other farm machines seems not to have occurred until the 1970s and 1980s (Beeley 1985: 291).

The village inventory introductions claim that the figures they report do not include nomadic populations and nomadic livestock. However, the Siirt and Mardin inventories include data on “distances ranged by villages using outside grazing grounds,” indicating that they surveyed populations engaged in transhumant herding of animals for part of the year. In Mardin province, people utilized grazing grounds up to 250 kilometers from their villages and the highest amount of movement occurred in the subdistricts of Cizre, Idil, Kiziltepe, and Midyat (İşkân Plânlama Dairesi Başkanlığı 1966b: 55). In Siirt province, inhabitants moved to pastures up to 120 kilometers from their villages. The survey notes the presence of house-inhabiting nomads in two villages of Eruh subdistrict and tent-inhabiting nomads in one village of Şirvan subdistrict (İşkân Plânlama Dairesi Başkanlığı 1966c: 57, 104, 106). No mobile herding is indicated for Diyarbakır province. Although groups passed through this area (Erhan 1992), perhaps they did not have villages. Percentages of land given over to pasture for the three subdistricts were 30.8 % of Batman (İşkân Plânlama Dairesi Başkanlığı 1966c: 36), a negligible percentage for Mardin (İşkân Plânlama Dairesi Başkanlığı 1966b: 35), and 3.1% of Bismil (İşkân Plânlama Dairesi Başkanlığı 1966a: 34-35).

The expansion of agriculture and urban settlement in lowland areas such as the Upper Tigris nation-wide has forced pastoral nomadic populations to winter on progressively higher slopes with more marginal pasture and water sources throughout the twentieth century (Frödin 1943; Johnson 1969: 22-24; Kolars 1963). The effect of agricultural expansion on pasture availability in the Upper Tigris can be seen Bismil subdistrict, one of the most agriculturally productive areas of Diyarbakır province. The pasture and meadow assessment for Bismil in the early 1960s indicates that grazing areas were more highly fragmented than any other subdistrict in the province (İşkân Plânlama Dairesi Başkanlığı 1966a: 54)

Hirbemerdon Tepe Study Region

Geography

The HMTS team collected ethnoarchaeological and archaeological data on pastoral nomadic landscapes at the east end of the Upper Tigris River Valley. The study area is located on the south bank of the Tigris surrounding its confluence with the Batman Su and directly opposite the Ramandağ anticline. The survey region is arbitrarily defined, according to the Turkish Ministry of Culture and Tourism's regulations for a site hinterland survey, as the land within 5 kilometers of the excavation at Hirbemerdon Tepe. As the tepe itself sits on a bluff directly above the Tigris, the survey area takes a roughly semi-circular shape encompassing 47 square kilometers (Figure 3.5).

The study area straddles two distinct geomorphological zones. To the west are the relatively flat terraces of the Tigris River Valley and the surrounding undulating steppe-plains, both suitable for dry agriculture. To the east steep cliffs sharply constrain the valley and the terrain consists of eroded slopes forming the foothills of the Tur Abdin Mountains. In this topographically uneven area, agricultural potential is limited. The pattern described above for the entire Upper Tigris area, in which the Tigris River's confluents cut through the landscape at right angles in relationship to topographic folds, holds for the smaller survey region. In both the western and eastern portions of the survey area, the hydrological landscape is characterized by deeply incised seasonal drainages (wadis) whose narrow beds are dry for much of the year. These drainages uniformly flow from south to north to join the west-east flowing Tigris.

An additional, roughly square area of 440 square kilometers directly to the east of the survey area was examined using high-resolution satellite imagery because the environmental characteristics of this larger area were essentially identical to those of the eastern uplands within the Hirbemerdon survey area (Figure 3.6). This roughly square area encompassed eroded limestone hills of the Tur Abdin Mountains in a similar distance range (within 5 kilometers) from

the Tigris River, extending eastward from the eastern boundary of the Hirbemerdon survey area to the historical and archaeological cave city of Hasankeyf, essentially most of the distance between the Batman and Garzan Sus' points of confluence with the Tigris. This approximately 25 kilometer-long stretch of the Tigris River frequently also is sharply constrained by cliffs. Like the Hirbemerdon survey area, this eastern area is characterized hydrologically by south-to-north flowing seasonal drainages systems and archaeologically by a lack of evidence for long-term sedentary settlement or intensive agriculture.

Only the northwestern tip of the Hirbemerdon survey area was covered under previous geomorphological mappings of the river terraces (Doğan 2005: 77; Kuzucuoğlu 2002: 764-765). Although detailed geological study was not undertaken, analogy and observation allow the extension of this alluvial terrace mapping eastward. Portions of all 5 previously identified terraces are present in the western portion of the survey area. Only the most recent of the terraces (T5) is present in the eastern portion of the survey area where the Tigris is incised into vertical limestone bluffs.

The Hirbemerdon area an ideal region in which to pursue a program of synthetic archaeological, ethnographic, and historical research focused on local landscapes of pastoral nomadic land-use for several reasons. First, the eroded upland¹ terrain in the eastern portion of the survey area and in the area studied via satellite imagery to the east of the survey area has never witnessed urban development or extensive agriculture, allowing the preservation of campsites and other ephemeral landscape features relating to herding. Second, the Upper Tigris

¹ The term “uplands” is to describe and refer to the eastern portion of the survey area. However, this term should not be confused with “highlands,” used to describe and refer to the mountain summer pastures of vertically transhumant pastoral nomads. The Upper Tigris region, including the entire survey area, is a “lowland” area inhabited by pastoral nomads in the winter because of milder climate and minimal snowfall. The survey area’s “eastern uplands” are a higher, more uneven area at the edge of this lowland plain.

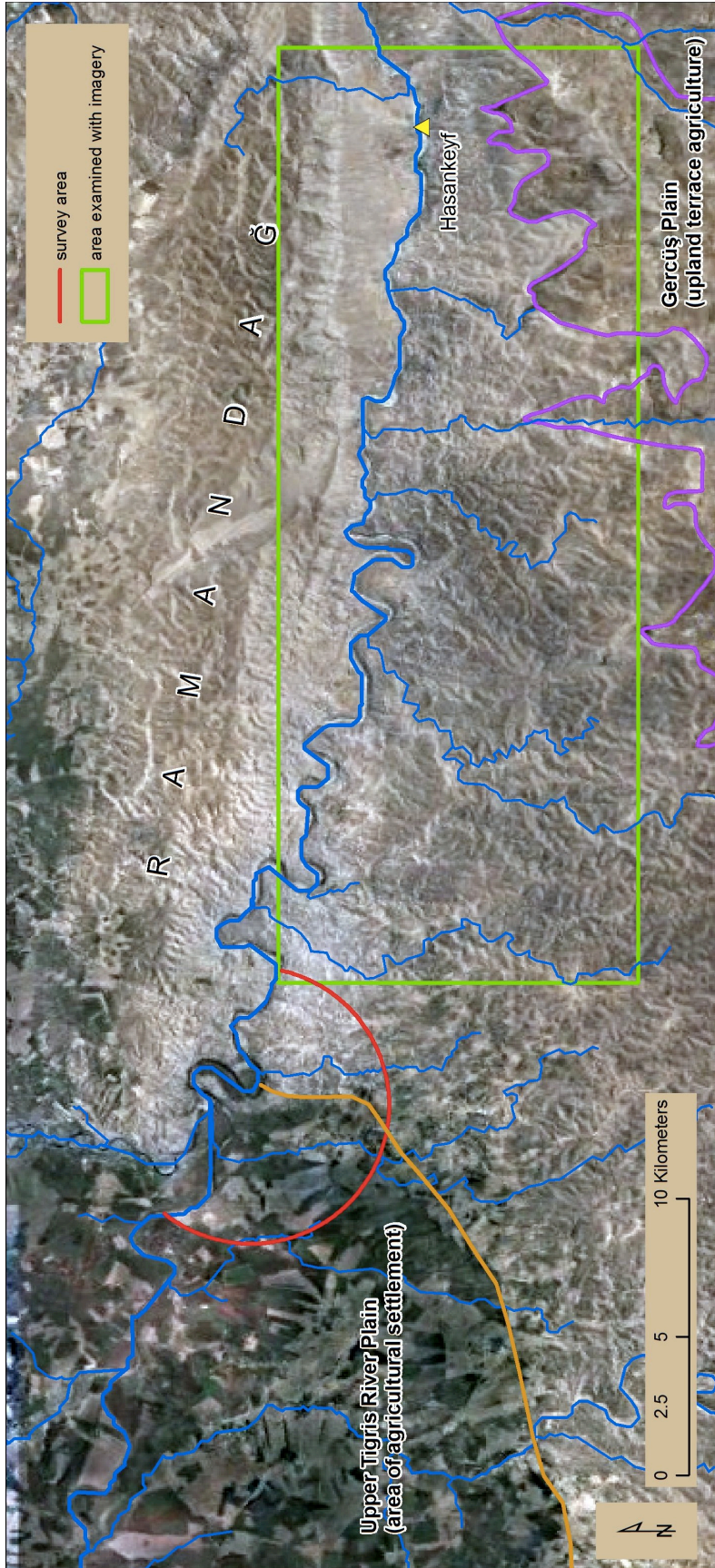


Figure 3.6: Area to the east of the Hirbemerdon Tepe study region that was examined using Digital Globe Imagery on Google Earth.

region is an area where sheep and goat pastoral nomadism has been historically well documented over the last millennium (Cribb 1991b: 185-211; Gündüz 1997; Hütteroth 1959; Şahin 2006: 43-44; Sümer (Demirtaş) 1949; Sümer 1992; Woods 1999). This record extends to the present day; the marginality of this land has kept it open to groups that are among the last pastoral nomads in the Middle East (Erhan 1992: 92-105; Planhol 1959: 529). While most pastoral nomadic groups in Turkey have fallen victim to forced settlement policies, as well as to less formal processes, such as the growing concept of private land ownership and the end of open range traditions (Bates 1980: 124-5, 130), some people still migrate between summer pastures in the Taurus mountains and winter grazing grounds in the Upper Tigris River Valley. Their presence in this region presents a unique opportunity to combine an unusually rich archaeological dataset with ethnoarchaeological material. Finally, previous surveys of mounded sedentary sites in the surrounding region (Algaze, et al. 1991; Ay 2001; Kuzucuoğlu 2002) provide an important body of comparable material for dating purposes and for understanding overall settlement patterns from the Neolithic through modern periods as well as some Paleolithic caves and open-air sites.

Historical Isolation of the Study Area

Distance and topography isolate the Hirbmerdon Tepe area from all of the known major historical interregional trade routes, and this isolation must have affected the agricultural and pastoral potential of the area in the past. Significant transportation costs would have discouraged a surplus agricultural economy in the area and encouraged the use of the land as pasture for mobile herds. Before the introduction of motorized transport in the twentieth century, bulk movements of surplus agricultural products would have been extremely difficult.

The Tur Abdin Mountains that topographically constrain travel to the east and south of Hirbmerdon Tepe also constrain regional movement between ancient urban centers the plains of the Syrian and Iraqi Jazira, ancient settlements the Upper Tigris River Valley, and the resource-rich Taurus Mountains beyond. Tracing the historical route through the Tur Abdin is critical for

documenting the relative historical isolation of the eastern end of the Upper Tigris River Valley and Hirbemerdon Tepe itself. The mountainous, rural, fragmented nature of the Tur Abdin, particularly its western extent, constrains the possible access routes to three: from Diyarbakır in the north, from the south along the Jaghjagh (via Nusaybin and Midyat), and from the southeast (where the more gradual slopes of the basalt ranges of the eastern Tur Abdin give access to the interior mountain plateau) (Radner 2006: 277). The Tigris River's course through sheer cliffs between the Batman Su confluence and the Cizre-Silopi plain constrains possible crossings to the Upper Tigris Valley itself or, from the Medieval period onward, the bridge at Hasankeyf. Within the Upper Tigris Valley, bridges have existed in the recent past at several locations, including north of Üçtepe and 6-8 kilometers northeast of Bismil near the Pamuk Çay (Comfort 2009: 121-122).

The main routes through the Tur Abdin have fluctuated through time but have some common aspects, one of which being that they did not cross the Hirbemerdon Tepe region (Figures 3.7 and 3.8). Today, the major routes follow the primary Mardin-Diyarbakır highway and the secondary roads from Mardin to Midyat and finally Batman via Hasankeyf. The first road follows a modern route that was not used in antiquity. Historical literature shows that Mardin was removed from most caravan routes in the past (Radner 2006: 291-292). In the Ottoman period, the main trade route through Diyarbakır province ran from Ergani to Nusaybin, thus avoiding the eastern end of the Upper Tigris (Salzmann 1995: 291-292). Nineteenth century travelers typically took a route from Nusaybin to Midyat and followed the course of either the Göksu or the Savur Çay into the Upper Tigris Valley (Sinclair 1989: 286, 311). The earliest known historical documentation of such routes dates to the Neo-Assyrian period, when the scribes of King Assurnasirpal II recorded the itinerary of the 882 and 879 BC campaigns to

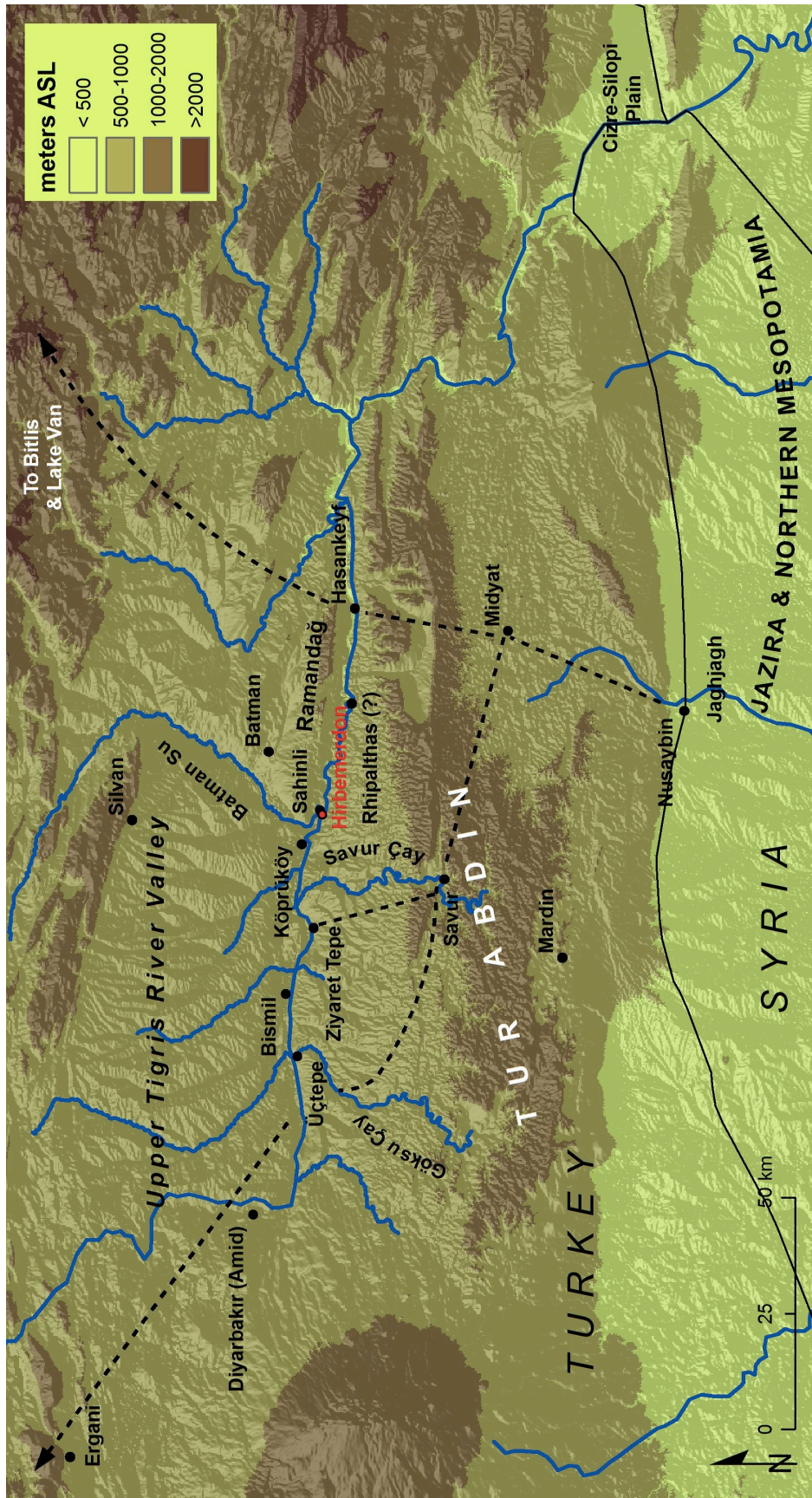


Figure 3.7: Major historically-documented routes between the Syrian Jazira and the Upper Tigris River Valley through the Tur Abdin.

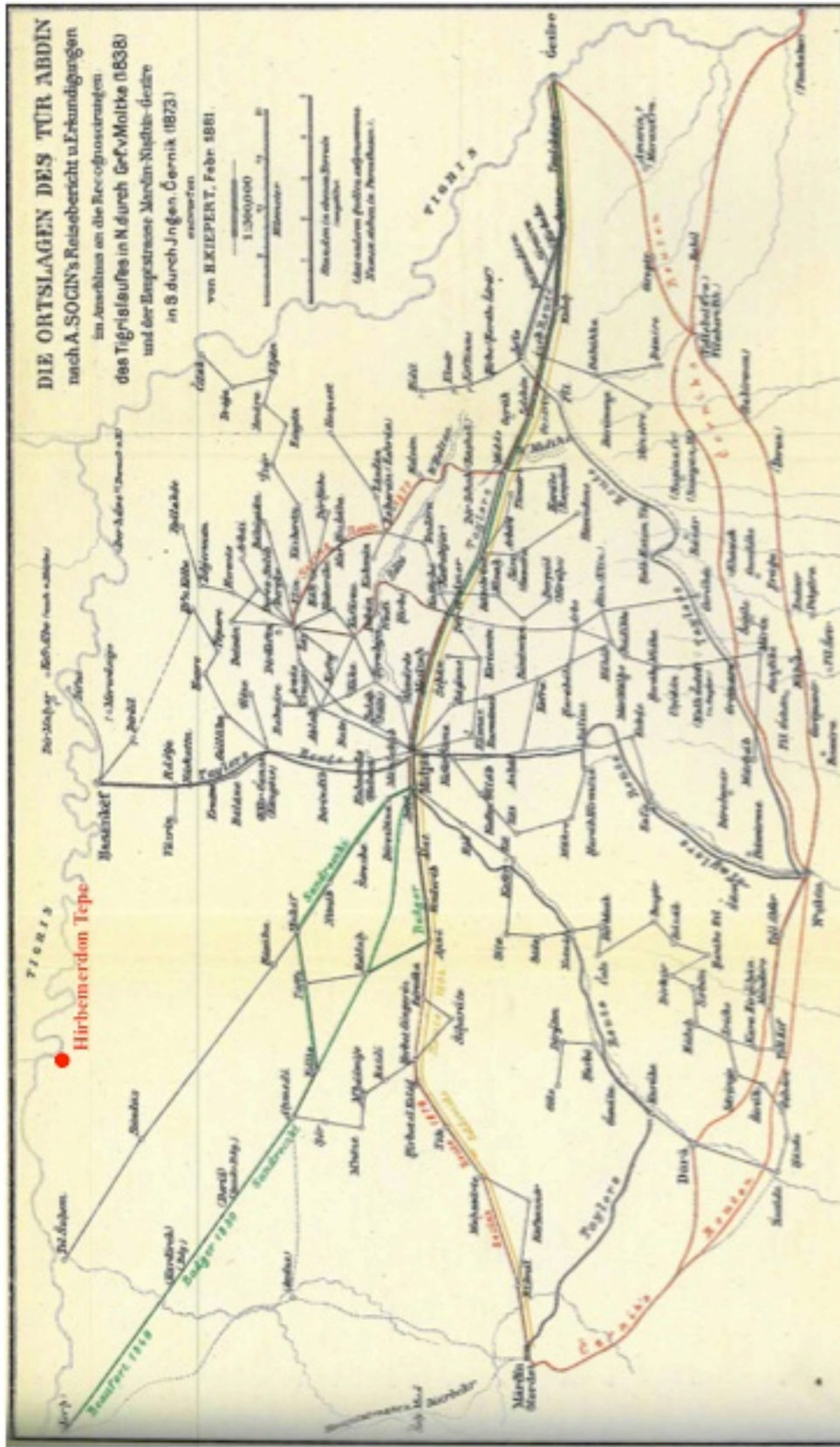


Figure 3.8: Schematic map of the Tur Abdin, by Socin 1881, showing the routes that various travelers took through the region. The approximate location of Hirtbemerden Tepe is indicated. Although most of the routes bypass the study area, one path is noted between Midyat and Sündüs (modern Güzelköy, at the south boundary of the study area).

conquer the Upper Tigris River Valley. Studies of the relevant cuneiform texts indicate that in 879 BC the Assyrian army traveled from the Sufan Çay to Haberli to Kivakh to Midyat and from there to the region of the provincial capital at Ziyaret Tepe (Tushan) (Radner 2006: 275-276; 287-291). Unfortunately, it has been impossible to match Assyrian toponyms with exact locations for the area between of Midyat and the Upper Tigris (Na'iri), the very area that is most relevant for the present study (Kessler 1980: 51-56, 67-69, 78; Liverani 1992: 58-60, fig. 6). It is suggested, partly on the basis of the texts' reference to "Shura" (Savur?), a city which the army did not reach, and partly on the basis of analogy with nineteenth century travel itineraries, that the army must have taken a route following the Savur Çay (Radner 2006: 289).

Regardless of the precise historical route between Midyat and the Upper Tigris Valley, it can be said with some confidence that this route would not have crossed the east end of the valley and the HMTS survey area. The Savur Çay, a wadi of unknown name, and the Göksu Çay, which enter the Upper Tigris Valley approximately 15, 25, and 50 kilometers southwest of the survey area, are the main drainages and thus provide the most logical (and most historically evidenced) routes through the northern Tur Abdin. The major historical cities (Amid, Silvan, Üçtepe, Ziyaret Tepe) are north and west of the Savur and Göksu exits into the Upper Tigris plain. Once on the plain, there would be little reason to turn east into the landscape-scale "cul-de-sac" formed by the intersection of the Ramandağ, the deeply incised Tigris, and the northernmost Tur Abdin foothills. The other major historical route through the region, Mardin-Midyat-Hasankeyf-Bitlis, puts travelers in a position from which topography makes it almost impossible to reach the Hirbemerdon Tepe area directly. Extensively surveys have not been conducted, but satellite imagery suggests that the only major historical construction in the area between the Batman Su-Tigris confluence and Hasankeyf is a Roman fort 16 kilometers west of Hasankeyf, which might have been the fortress of Rhipalthas (Comfort 2009: 61). The spatial distribution of mounded ancient sites experiencing extended inhabitation is also indicative of possible routes of travel. Large tells do not occur east of the Savur Çay.

Although not a thoroughfare for regional traffic, there are other archaeological indications that the east end of the Upper Tigris River Valley was crossed by local traffic. Archaeological survey recovered two bridge sites on either side of the Tigris-Batman Su confluence, one 6 kilometers upstream at Köprüköy and the other immediately downstream at Şahinli (Algaze 1989; Algaze, et al. 1991).² These bridge sites might have been in use as early as the Roman and Neo-Assyrian periods, respectively (Comfort 2009: 61-62).

Current Land-use and Effects on the Archaeological Record

The current Kurdish inhabitants of the terrain within the western portion survey area live in small agropastoral villages whose historical demography is discussed in Chapter 4. The majority of these villages are located either beside or on top of mounded archaeological sites (*höyük*). Rectilinear-shaped agricultural fields surround the villages and are adjusted in dimension, shape, and layout according to the undulating terrain. Irrigation agriculture is mostly confined to small plots on the lowest of the stable alluvial terraces, T4. Above the terraces of the river valley, the villagers plant mostly unirrigated cereal crops. The one exception to this is cotton, which farmed in irrigated plots above the alluvial terraces with water pumped from the Tigris. Village-based herds of cattle, sheep, and goat are grazed on fallow fields, grasslands outside of the fields, and occasionally on chaff following the harvesting of cereals in early June. Following this harvest, many cereal fields are burned. After the ash blows away, the fields tend to remain free of wild vegetation for at least a year.

The impending closing of the Ilısu dam, which is expected to flood the eastern portion of the river valley as far west as Bismil and result in the relocation of tens of thousands of villagers (Shoup 2006), appears to have disrupted many agricultural patterns, especially the alternate year fallow cycle and field rotation. During the four summers of fieldwork (2007-2009, 2011), some fields were planted every year and others remained continuously fallow. The social and

² For other bridges in the region, mostly from the medieval period and later, see Cahen 1935: 272 and Sinclair 1989.

economic changes wrought by the completion of GAP dams elsewhere in southeastern Turkey (Aksit and Akcay 1997) are still pending in this region.

The land-use situation in the eastern portion of the survey area is more complicated. East of the Batman Su-Tigris confluence and Hirbemerdon Tepe, as the landscape becomes more uneven, the soil becomes increasingly stony. This is marked by rather sudden transition in local village architecture from predominantly mudbrick to predominantly stone structures. The marginality of this stony upland area within the current farming system is evidenced by the distribution of villages and the lesser intensity of agriculture. The eastern portion of the survey area completely lacks modern villages. There are several villages just outside survey area as well as the remains of an abandoned village along the survey area's northeastern boundary, but the overall density of inhabitation is much lower than it is to the west. Derelict field systems are delimited with linear stone boundaries and pock-marked with piles of stone cleared from topsoil. These fields are limited to the narrow edges of the seasonal drainages, where thin soils have accumulated, and the relatively flat plateaus isolated between the drainage systems.

Some but not all of the fields in the eastern uplands are a twentieth-century development having to do with the spatial expansion of farming. Upland fields are clearly visible in the CORONA imagery (Figure 3.5), suggesting that farming was possible in these areas before widespread agricultural mechanization. The strongest argument for the recent nature of some of the agricultural fields in this region is the presence of the remains of twentieth century pastoral nomadic campsites, the subject of Chapter 6. However, this argument can also be made on the basis of landscape characteristics, accessibility, and historical geography. The terrain and soil make this region less than ideal for agriculture, and the productivity of upland fields seems to be highly variable. During the four seasons of fieldwork, the configuration of these fields and location of crops changed drastically every year. Maps created from nineteenth and early twentieth-century Ottoman documents and maps produced from the 1960s village inventories show an almost complete lack of settlement on the southern bank of the Tigris from the Batman

Su confluence 35 km downstream to Hasankeyf, as will be discussed in greater detail in Chapter 4. The lack of roads and settlement in this area extends to the present day. The southern bank of the Tigris remains so inaccessible that it is faster and easier to travel from Hirbemerdon Tepe to Hasankeyf via the bridge at Bismil and Batman (a total distance of approximately 120 kilometers) than to travel directly east (approximately 30 kilometers).

Many of the modern fields present in the eastern uplands are created and tended by people who live on the opposite side of the river, but this may or may not have been the case in the past. Geographically many parts of the eastern uplands are closer and considerably more accessible to modern asphalt roads in Batman province and markets in the city of Batman, across the river, than they are to asphalt roads in Diyarbakır province and markets in the city of Diyarbakır, on the same side of the river. However, Batman has only very recently become a urban hub, with the discovery of oil in the vicinity of the Ramandağ anticline. Diyarbakır, as Chapter 4 discusses, has a long history as a regional population and economic center. Further, residents of the Batman side of the Tigris are able to access fields in the uplands to the east of Hirbemerdon Tepe because the modern Tigris water levels are quite low, particularly during the summer. Just a century ago the Tigris would have not been so readily fordable, and people probably were more likely to cross the river on bridges. One former bridge is located within the survey area, to the north of Hirbemerdon Tepe.

Pastoral Nomadism in the HMTS Region and the Upper Tigris River Valley

Winter and Summer Pasture Areas

The remains of pastoral nomadic campsites and landscape features in the Upper Tigris region and the HMTS study area in particular could be related to one of two historically and ethnographically documented transhumance patterns relating to the herding of primarily sheep and goat. The first pattern concerns specialized long-distance vertical pastoral nomadism, the

subject of Chapter 2. During the nineteenth and twentieth centuries, the Upper Tigris River Valley served as a winter camping area for groups moving between this area and the Taurus and Anti-Taurus Mountains to the north and northeast of Diyarbakir (Cribb 1991b: 198; Hütteroth 1959; Wehling 1992) (Figure 2.3). Chapter 4 reviews historical information demonstrating that various groups from the fifteenth century onwards practiced this general transhumance pattern. Historical records indicate that the Upper Tigris River Valley and the Tur Abdin were also used as a transient camping area for groups moving between summer pastures in the Taurus Mountains and winter pastures in the Jazira as far south as Mosul, Iraq and Raqqah, Syria. The Taurus-Upper Tigris pattern was for some groups a truncated version of this Taurus-Jazira pattern, resulting from the delineation of modern nation-state borders following World War I (van Bruinessen 1992).³

The second pattern concerns short-distance vertical seasonal transhumance by mixed-economy villagers. The history and literature of Assyrian communities in the Tur Abdin indicate that during the summer herds were taken away from villages and pastured in the hills by young males (Lamassu n.d.). There is little ethnographic and historic data on these patterns, which did not as readily attract the attention of the Ottoman government because of the shorter distances involved. However, similar patterns have been studied historically and ethnographically in areas south of Lake Van (Hütteroth 1959). Movement of a comparable nature, but occurring in winter, has been studied in northern Iraq (Solecki 1952; 1979; 1998). Short distance winter transhumance for herding purposes occurs today in small villages in southeastern Turkey, with only a shepherd (not a whole family) accompanying the flock.

³ The Angora (Ankara) Accord between France and Turkey (October 20, 1921) and the Treaty of Angora (June 5, 1926) between Turkey and Britain allowed for pastoral movement between Turkey and Syria and Turkey and Iraq, respectively. The final clause of the Angora Accord states that “the sedentary or seminomadic inhabitants enjoying pasturage or holding property on either side of the fixed line shall continue to exercise their rights as in the past.” However, the Angora Convention between Turkey and France five years later (May 30, 1926) restricted this privilege to those living within five kilometers of the border (American Geographical Society 1927).

On a regional scale, the eastern end of the Upper Tigris River Valley represents a transitional zone in terms of geographic orientation, and these changes in geographic orientation in turn are correlated with spatial patterns in vertical long-distance pastoral transhumance. The relief structures immediately north and northeast of the survey area, that is, the Ramandağ and most of the mountains south of Siirt province, have a northwest-southeast trend. To the northwest and west of the survey area, west of the Batman Su and Savur Çay, the mountains north of the Upper Tigris Valley take a west-east course (Tolun, et al. 1962: 34). From a geometrical perspective, this change in trend orientation represents the inner curve of the southeastern Taurus Mountains as they arc towards the southeast and join the Zagros mountains of Iran. The transhumance cycles of long distance pastoral nomadic groups as recorded by ethnographers and travelers of the twentieth century reflect this geological shift. Pastoral nomadic groups who summered in the mountains south of Lake Van in the 1950s followed roughly west-east routes from the high mountains to lower areas between Batman and Siirt (Hütteroth 1959). Groups summering further north and west in the vicinity of Bitlis, Muş, Bingöl, and Elazığ followed more north-south or northeast-southwest routes between the Taurus and the plains surrounding Diyarbakır (Frödin 1943; Skogseid 1993). Essentially this means that pastoral groups moved over regional distance at right angles to the mountain folds, following routes that would have been generally parallel to the course of the major tributaries of the Tigris. This observation suggests that over regional distances pastoral groups followed routes that took topography and transportation effort into account. This regional picture stands in contrast to the conclusions about local pastoral landscapes in Chapter 2, where various ethnographies indicated that daily pastoral rounds did not follow cost path principles.

Models of Regional Migration Routes

Satellite imagery and topographic data assist in assessing the spatial requirements of transhumance and possible paths of long-distance migration via least cost path analysis. The

Hirbemerdon Tepe Survey region and the Upper Tigris River Valley unfortunately fall on the edge of the area south of Lake Van whose nomadic tribes' migration routes were described in detail by a Swedish geographer in the 1940s (Frödin 1943) and mapped by a German ethnohistorian in the 1950s (Hütteroth 1959) and by a Turkish sociologist in the 1960s. In many cases the actual routes compare well to those that would be predicted by least cost path analysis using campsite locations and distance and slope from 250 meter resolution digital topographic data (down-sampled 90 meter Shuttle Radar Topography Mission data). The deviations between the actual and modeled paths are predictable: whereas the modeled paths follow the drainage bottoms, the actual paths follow the ridges above the drainages, where pastoral nomadic groups were probably less likely to encounter the fields of sedentary agricultures and where pasture may have been more abundant (Figure 3.9).

Similar GIS methods were employed to model the migration routes for groups who wintered in the Hirbemerdon Tepe Survey area. Vague descriptions of migration routes through this area in the nineteenth and twentieth centuries had the areas around Bingöl and Muş as summer termini (e.g., Frödin 1943; Skogseid 1993). It is difficult if not impossible to archaeologically demonstrate particular transhumance routes for particular historical periods except via strontium isotopic analysis of teeth. However, GIS analyses can provide a range of possibilities than can be considered in relationship to archaeological data. Least-cost paths between the Upper Tigris and the Bingöl/Muş area indicate such migrations could have required biannually covering a distance of 150-200 kilometers and vertically gaining or losing up to 3000 meters. These distances are within the ranges traveled by the other transhumant pastoral groups in Iran and southeastern Turkey discussed in Chapter 2 (Figure 3.10).

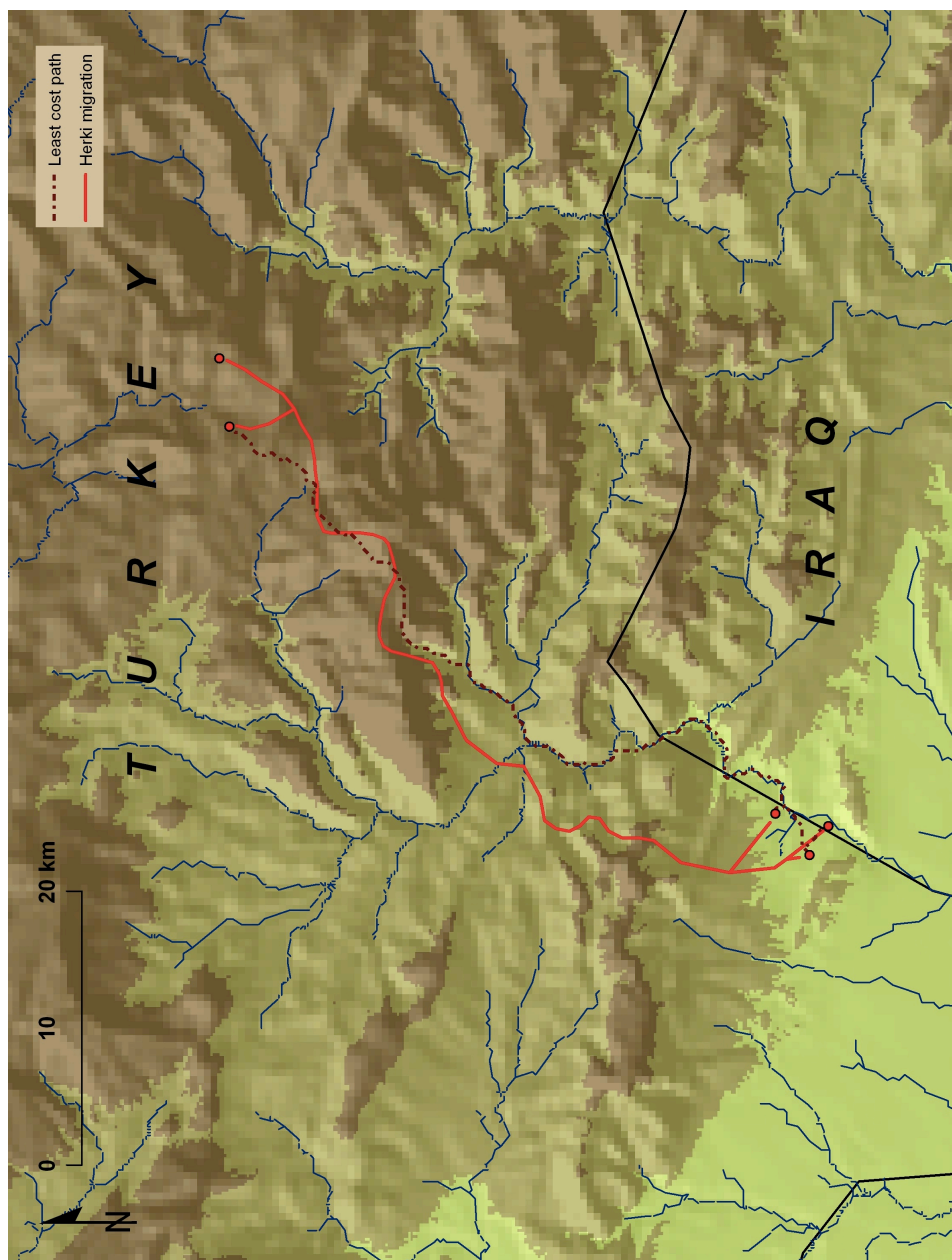


Figure 3.9: Comparison between actual migration route (Herki tribe, south of Lake Van, Hütteroth 1959) and that predicted by least cost path analysis.

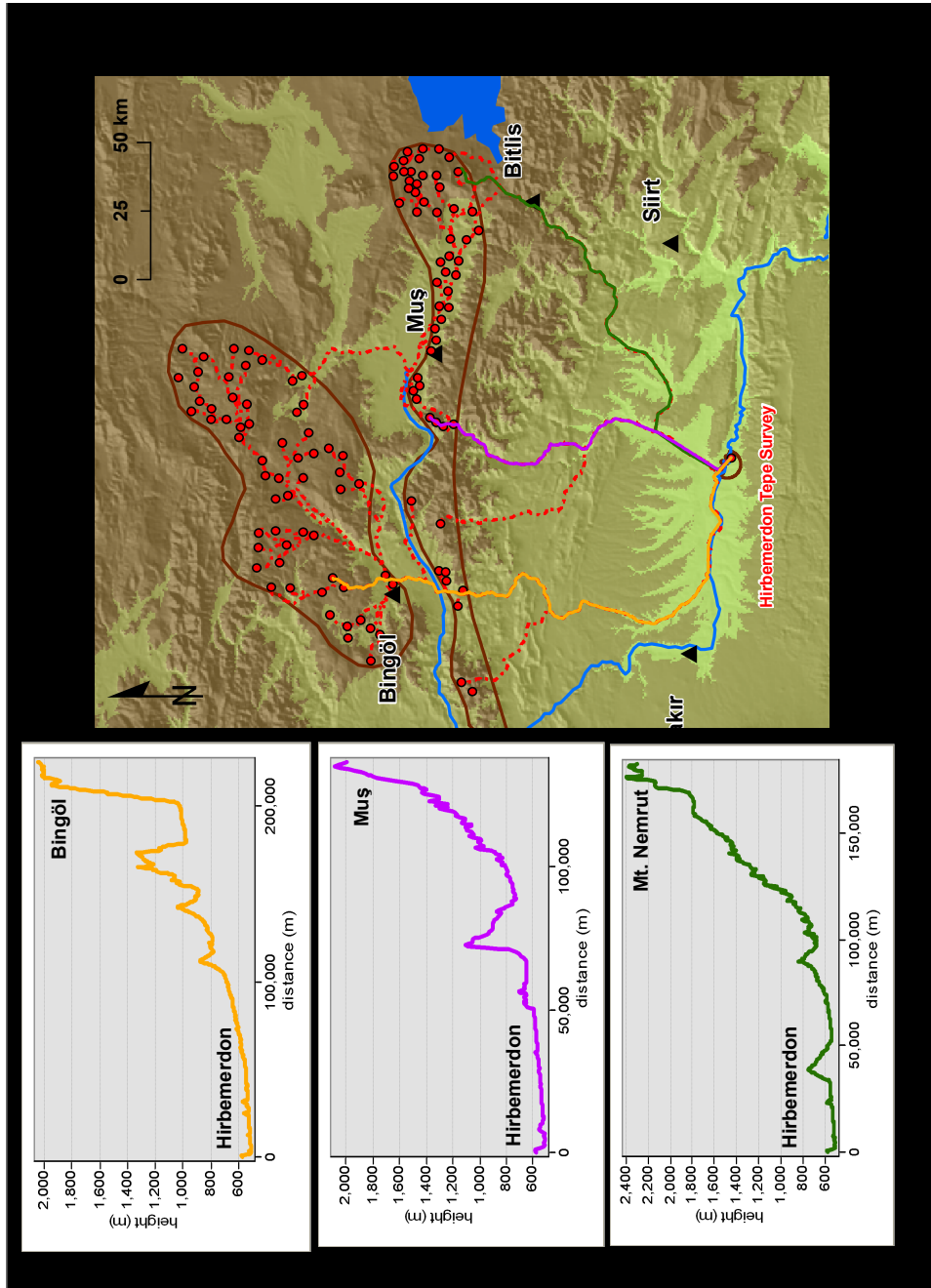


Figure 3.10 Graphs showing a topography profile of the least cost paths between the Hirbemerdon Tepe region and three historically documented summer pasture areas in the areas of Bingöl, Muş, and Mount Nemrut (Tatvan).

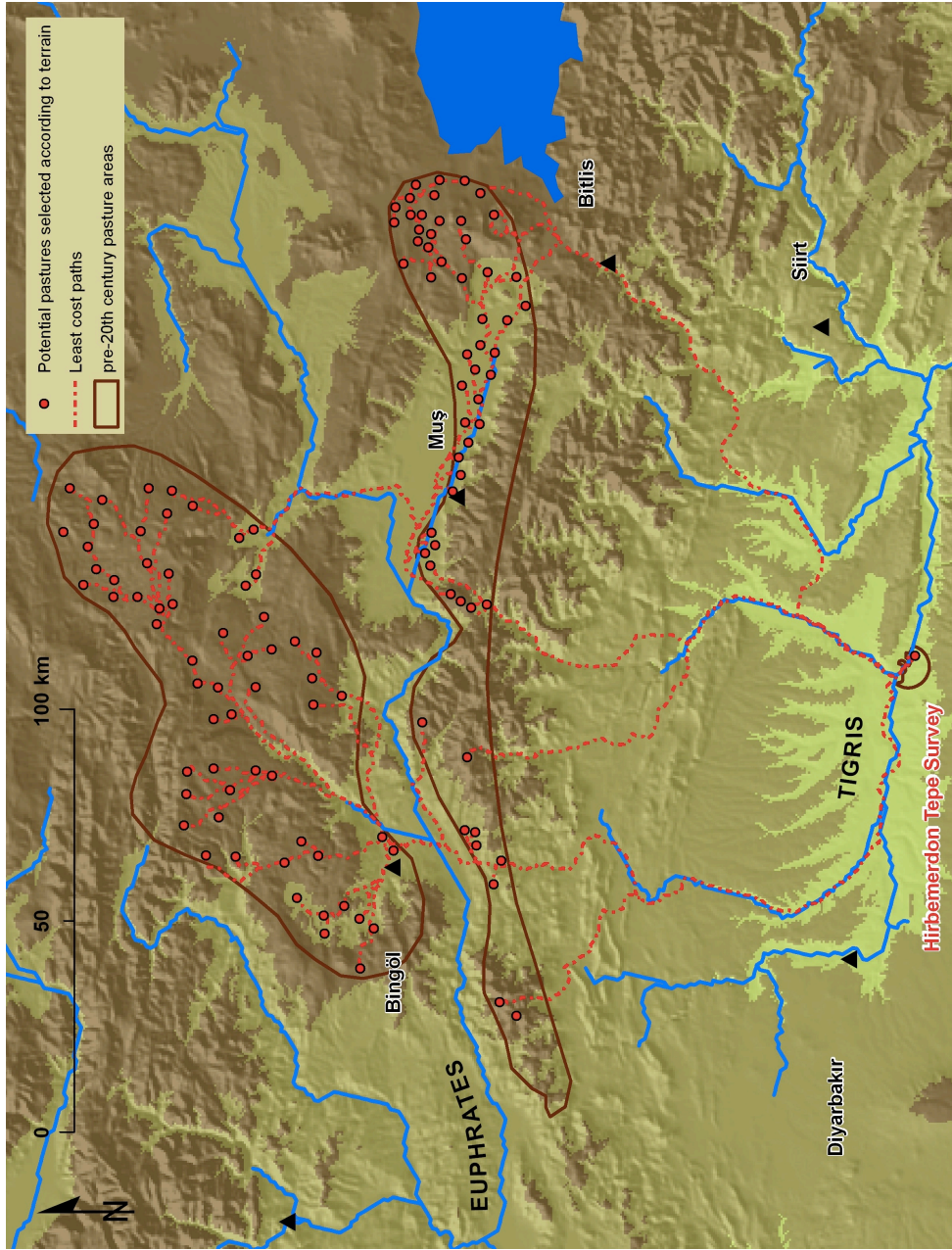


Figure 3.11: Least cost paths between the Hirbemerdon Tepe region and the closest historically documented summer mountain pasture zone. Potential pastures in these areas selected on the basis of Landsat imagery.



Figure 3.12: Bridge sites in the Hirbemerdon Tepe region and migration routes predicted by least cost path analysis.

These models suggest that, from Muş and the western Van region, nomadic groups would have entered the Upper Tigris Region along the Batman tributary of the Tigris (Figure 3.11). After crossing the bottlenecks of the mountain passes, camping and herding groups could have spread throughout the east end of the Upper Tigris Valley. To reach campsites and pastures near Hirbemerdon Tepe, groups would have had to cross the Tigris itself. The extremely rough terrain and river bank cliffs east of the study area makes it unlikely that groups would have crossed the Tigris further downstream. The nearest bridge site is within the bounds of the survey area at the Batman Su-Tigris confluence and is no longer in use (Figure 3.12).

Conclusion

Regional environment and geography form important parts of every landscape archaeology project and survey, as they hold clues to the distribution of archaeological sites and the formation processes involved in the creation and preservation of archaeological landscapes. A regional environmental perspective is particularly important when considering the pastoral landscapes whose inhabitants may have been engaged in seasonal transhumance.

The 47 square-kilometer area of the Hirbemerdon Tepe Survey covers two geomorphological zones: the eastern end of the Upper Tigris River Valley, a steppe-plain forming a northeastern extension of the northern Mesopotamian plains, and the northern-most part of the Tur Abdin Mountains, a set of eroded limestone hills separating the Upper Tigris River Valley from the plains of northern Syria and northern Iraq. Climatically, moderately cold, rainy winters and extremely hot, dry summers characterize the area. Most precipitation falls between November and April. Culturally the area has been home to agricultural and pastoral societies since the Neolithic period, and before that the archaeological record also shows evidence of Paleolithic inhabitation. Topography and distance from major trade routes have historically isolated the area.

The Tigris River has formed five alluvial terraces in the vicinity of the study area. The highest three have been stable for human settlement over thousands of years. The second lowest terrace has a somewhat turbulent geological and settlement history, and may have been periodically flooded for parts of the Bronze Age. The lowest, most recent terrace appears to have formed since roughly 1200 BC and has generally not been stable for settlement. In modern times, the Tigris carries less water than it did in the past, and parts of the river that are currently fordable may not have been as little as a century ago. The height of the alluvial terraces in relationship to the incised Tigris bed means that irrigation agriculture would not have been possible in the area before the introduction of mechanized pumps in the twentieth century.

Irrigation agriculture and mechanized farming are two of the primary forces destroying archaeological landscapes around the globe, but these forces did not fully affect the Upper Tigris area until quite recently. Further, these forces have largely not transformed the topographically uneven landscape of the Tur Abdin Mountains. Village inventories conducted by the Turkish Republic in the 1960s indicate that mechanized farming and widespread pump irrigation did not appear in the Upper Tigris area until the 1970s and 1980s. Thus, historical satellite photographs dating to the late 1960s are likely to be useful indicators of the possible spatial extent of pre-modern agriculture.

The Upper Tigris area falls immediately south of the Taurus-Zagros Mountain arc extending across Anatolia and Iran, and at various points in history pastoral nomads have integrated the Upper Tigris region with mountainous areas to the north and east. These pastoral nomads engaged in long distance transhumance between lowland winter pastures and highland summer pastures or in short distance transhumance from mixed-economy settlements to pastures in nearby hills. Topography and ethnographic data suggest long-distance transhumance routes covered 150-200 kilometers and may have partially followed the course of the Batman Su.

CHAPTER 4: HISTORY, MOBILITY, AND LANDUSE IN THE UPPER TIGRIS REGION CA. 1400-2000 AD

Introduction

The disjuncture between archaeological knowledge of mobile pastoral groups in southeastern Turkey over the last millennium and historical evidence for such groups is enormous. In the few instances where events and populations of the last millennium have been investigated via survey and excavation, archaeologists have focused primarily on sedentary, urban communities. By contrast, the rich historical record makes frequent mention of powerful pastoral nomadic tribes and tribal confederations that alternatively clashed and cooperated with landed governments, raided and traded with sedentary farmers, and defended and shifted their pasture areas.

This chapter reviews the historical evidence for pastoral nomadism in southeastern Turkey over the last millennium. This evidence demonstrates the longevity of vertically transhumant pastoralism, the long history of certain migration routes, and trends toward the sedentarization of pastoral nomads in the Diyarbakır area. I focus specifically on how the sociopolitical relationships between pastoral nomadic groups and landed governments have influenced the location of pasture areas and pastoral land-use patterns. Over time, these relationships have shifted from an “enclosing nomadism” (Alizadeh 2010) situation in which pastoral nomads were demographically and politically dominant to an “enclosed nomadism” (Rowton 1974) situation in which pastoral nomads were demographically and politically dominated by the Ottoman and Turkish states. The historical accounts suggest that the position of the surveyed campsites at the eastern edge of the Upper Tigris River Valley constitutes evidence for the long-term spatial, social, and environmental effects of Ottoman policies towards pastoralism and agriculture.

However, pastoral nomads and rural land-use are not the primary topic of many historical documents. Where these topics are mentioned they are frequently discussed from the generalized, regional perspective of city-dwellers, providing little to no information on questions of local landscapes, daily movement patterns, and environmental modification. Such questions are best addressed through a landscape archaeology approach such as the one adopted by the Hirbemerdon Tepe Archaeological Survey.

Sources and Overview

There exist a wealth of primary and secondary historical sources for investigating the political and economic history of the east end of the Upper Tigris River Valley over the last 600 years. These sources owe their existence, preservation, and in many cases, modern study and translation, to the region's proximity to four historically important cities: Diyarbakır (Amid), Mardin, Midyat, and Hasankeyf (Figure 4.1). As the capital of several successive local polities and a provincial center of the Ottoman Empire and later the Turkish Republic, Diyarbakır and its environs feature prominently in many political histories and architectural studies and are the subject of many demographic and tax records. Diyarbakır's position on a navigable portion of the Tigris River and its location along roads connecting far flung areas such as the Caucasus and Aleppo (via Lake Van and Urfa) as well as İstanbul and southern Mesopotamia (via Sivas, Mosul, and Baghdad) meant that it served as a stopping point on the itineraries of most travelers in the region, many of whom wrote accounts of what they saw and experienced. In addition to being important trade nodes in their own right, Hasankeyf, Mardin, and Midyat served as capitals of various medieval principalities and at various points as the center of eponymous *sancaks* (sub-provincial units/districts) of Diyarbakır under the Ottomans. As early centers of Syriac Orthodox

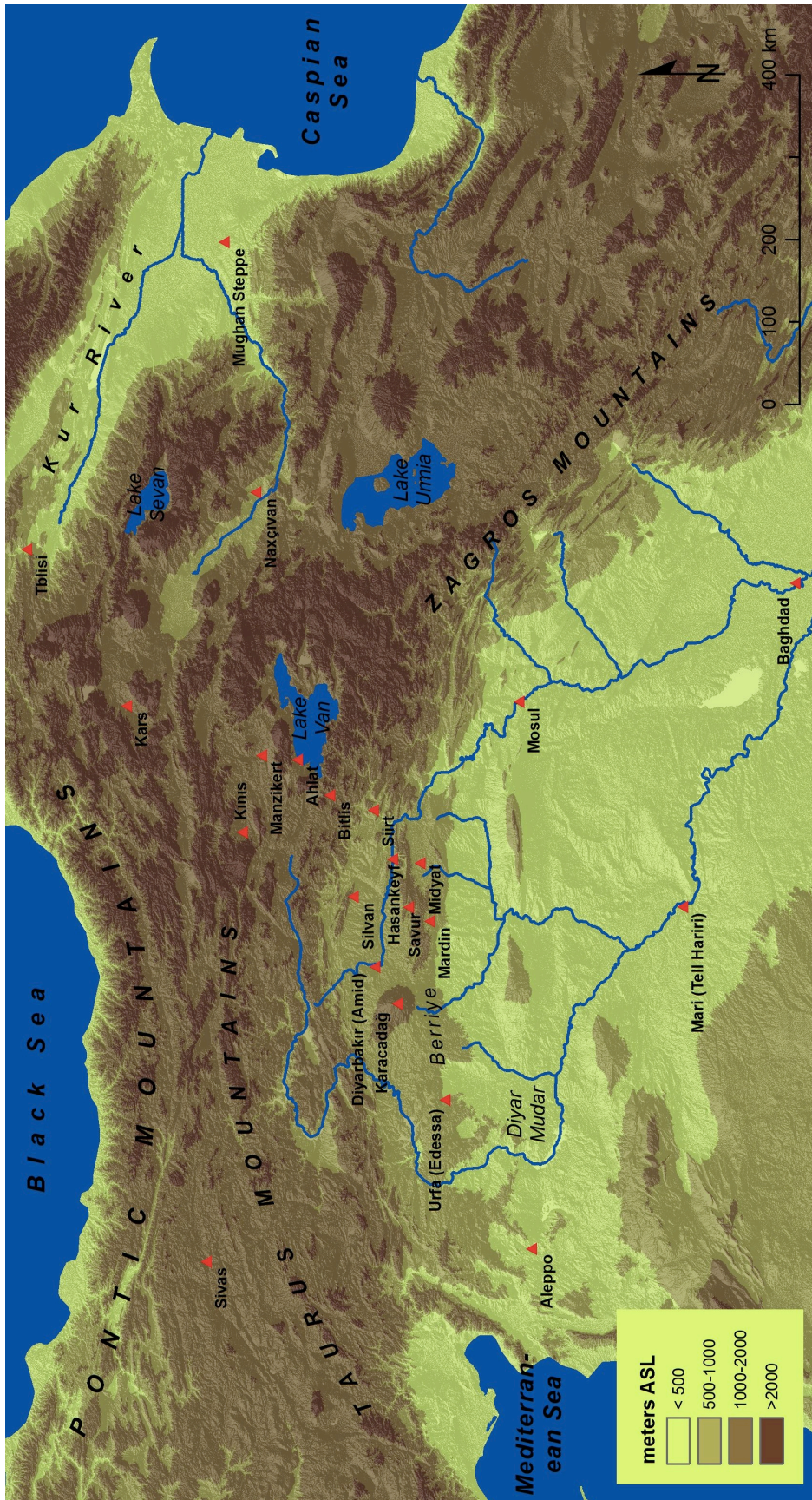


Figure 4.1: Sites and features discussed in the text regarding history before the Akkoyunlu (before the fourteenth century AD).

Christianity, Diyarbakır, Hasankeyf, Mardin, Midyat, and the entire Tur Abdin mountain region feature in chronicles and the records of monasteries and churches from the early centuries AD onwards.

The last 600 years in the Diyarbakır region⁴ can be broken politically and historically into three periods: the period of the Akkoyunlu confederacy 1378-1508, the period of the Ottoman Empire 1517-1914, and the period of the Turkish Republic 1923-present. Though outside the primary period of concern, the period from the tenth to the fourteenth centuries will be briefly reviewed in order to demonstrate that pastoral nomadism has a deep history in this region. The breath of the historical record and the wide range of languages in which the various sources are written (Syriac, Arabic, Persian, Ottoman and Modern Turkish, Greek, English, Italian, German, French) make it impossible to attempt a comprehensive survey here, and only translated primary and secondary sources in English and modern Turkish are used. At any rate, various scholars have already compiled bibliographic surveys of the literature for certain periods.⁵

The majority of the historical sources focus on presenting event-driven political histories, but the summary below attempts to tease out a narrative centered on the rural landscape and pastoral nomadism. Even in the most city-centric of historical sources there is relevant information to be gleaned about the demography and location of nomadic groups, the interactions

⁴ In attempting to address the situation in the specific study area at the far east end of the Upper Tigris River Valley, it is important to understand the changing usage of the toponym “Diyar Bakr/Diarbekir/Diyarbekr/Diyarbakır.” From the first millennium BC until the founding of the Turkish Republic, the modern city of Diyarbakır was known by variations of its Aramaic name: Amid, Amed, Amida. In the pre-Akkoyunlu periods where the Upper Tigris region was part of many different local principalities, “Diyar Bakr” seems to have sometimes been the term for a large part of the Upper Tigris River Valley east of the city of Amid (e.g., Ripper 2000: Kart 6). Other times, “Diyar Bakr” denoted a broad plain area southwest of Amid over to Edessa (modern Urfa) and the Euphrates (e.g., Peacock 2010: 130). Under the Ottoman Empire, Amid was the center of the *vilayet* (administrative unit) of Diyarbakır, whose extent was much greater than that of the modern-day province, and whose boundaries were frequently changed (Salzmann 1995: 285).

⁵ See (Woods 1999: 215-234) for sources on Akkoyunlu history, (İlhan 1989) for a review of the medieval sources relating to Diyarbakır, (Brubaker and Haldon 2001: 188-190) for Syriac chronicles and Arabic historiography, (Streck 1987: 875-876) for lists of travelers to the Tur Abdin and resulting cartography, (Yerasimos 1991) for travelers to Diyarbakır from the fourteenth to sixteenth centuries).

between these groups, settled societies, and landed governments, the spatial extent of agriculture, and the position of the eastern end of the Tigris River Valley in relation to political entities. Furthermore, there is a largely untapped potential to discuss the implications for pasturelands of the various historical events and processes, that is, how new political and social configurations resulted in new configurations of pasturelands.

The general picture built up by the sources characterizes the eastern end of the Upper Tigris Valley over the last 600 years as a marginal area that has experienced several episodes in settlement pattern discontinuity, and an area in which pastoral nomadism and agriculture have long coexisted and traded positions of predominance. The eventual result of trends and governmental policies beginning in the Ottoman period has been the emergence of an extreme form of enclosed nomadism at the end of the twentieth century where pastoral nomadism is clearly dominated by a sedentary way of life into which it is rapidly becoming incorporated.

No effort will be made to trace the potential continuity of specific nomadic tribes or tribal confederacies in certain territories. While tribally organized groups have continually filled the pastoral ecological niche requiring vertical transhumance between mountain and plain pastures, the identity of these groups has not been constant. For example, the Beritanlı, a formerly nomadic group whose members used winter pastures in the Diyarbakır region in the twentieth century, claims a 400-year history in the region via kinship with a group mentioned in the sixteenth century Kurdish history the *Sharafname*. As will be abundantly clear from the historical narrative presented below, there would be little reason to accept such a claim for any group in southeastern Anatolia, particularly for larger tribes such as the Beritanlı whose names would have appeared in historical documentation (Erhan 1992: 114-115). Frequently shifting political boundaries and migration from Central Asia in the Medieval period, massive westward and eastward migrations of pastoral nomadic groups within Anatolia in the Akkoyunlu and Ottoman periods, refugee influx from former Ottoman territories in the nineteenth and twentieth

centuries, and wars and genocides over the last century have all contributed to a high degree of population mobility and frequent shifts in rural land-use patterns.

Before the Akkoyunlu: Prehistory and the Arrival of the Turks

The most major historical event relating to regional land use and pastoral nomadism of the second millennium AD is arguably the eleventh-thirteenth century incursions of the Seljuqs, Turkic nomadic groups into Asia Minor, from the Central Asian steppes (Bosworth 1973: 315; Cahen 1968; Peacock 2010; Vryonis Jr. 1975).⁶ Many accounts dramatically present this event as a devastating one wrought by merciless raiding bands, resulting in the nomadization and Islamization of most of Anatolia (e.g., Khazanov 1984: 264; Vryonis Jr. 1971: 143-184), including the Upper Tigris Region (Cahen 1955: 94; Sinclair 1989: 397). While this population influx clearly did result in major demographic change in eastern Anatolia, the transition has been largely unstudied archaeologically, and it is important to understand that a nomadic lifestyle did not appear with the Turks (Peacock 2010: 152, 157). However, the arrival of the Turks may have resulted in significant changes in transhumance patterns as well as the sociopolitical organization of transhumant pastoral groups.

Indirect evidence of widespread nomad populations in prehistoric and early historic periods has been taken from voids in regional settlement patterns on the Mesopotamian plains, but here the discussion is constrained to specific pieces of historical evidence for mountain-based nomadism and herding in the Taurus region prior to the arrival of the Seljuqs. Excavation has demonstrated that vertically transhumant herding has deep roots in the Zagros mountains of Iran, with which the Taurus mountains are geographically contiguous, going back possibly as far as the late sixth and fifth millennia BC (Abdi 2003; Alizadeh 2010; Hole 1974; Mortenson 1972). Cuneiform texts from southern Mesopotamia in second millennia BC mention the presence of

⁶ For the devastation of the Marwanid-ruled Diyarbakır region by the Turkish invaders, see (Blaum 1993: 55-56)

Zagros mountain-based groups called the Kassites (Balkan 1986: 8; Heinz 1995: 167; Sassmannshausen 1999: 181, 411), who were likely transhumant, and eventually took control of Babylonia from the sixteenth to twelfth centuries BC. Southern Mesopotamian texts from the third to first millennia BC use the term “Gutian” quite generally to refer to various groups of “uncivilized” Zagros mountain people who raided agricultural settlements and may have been nomadic (Michalowski 1993: 27-28; Van de Mieroop 2002). In the late second and early first millennia BC, a tribe of horizontally transhumant nomadic Arameans from the Syrian steppes settled in the Diyarbakır area and established a kingdom called Bit Zamani by the contemporaneous Assyrian texts (Szuchman 2007). The presence of nomadic groups north of Diyarbakır in the sixth century AD is implied by an early Syriac chronicle that details the deeds of “Simeon the mountaineer,” a monk who apparently left a located monastery north of Amid and traveled into the Taurus mountains, where he re-converted wandering shepherds to Christianity (Brooks 1907: 232-233).

A long hiatus in historical information on transhumant pastoralists in eastern Anatolia exists until the arrival of Turkic groups beginning in the eleventh century AD. The invading Seljuq Turks from the cold Central Asian steppes probably found the Anatolian highlands, which were already largely deforested at this point, to have conditions similar to the areas from which they came (Planhol 1959: 525). In southeastern Anatolia, the patterns of long distance vertically transhumant pastoralism characterizing later periods are often argued to have developed as a consequence of the arrival of Türkmen groups and their mixing with local populations. Indigenous Kurdish tribes are assumed to have practiced much more circumscribed short-distance transhumance or semi-nomadism between village settlements and highland pastures “from time immemorial” (Planhol 1959: 525-528) with long-distance nomadism being a development of medieval origin. Documents relating to the Oghuz Turkish Artukid dynasty based at Hasankeyf and Mardin in the eleventh and twelfth centuries, on the other hand, suggest that “the introduction of the Turcoman element had no effect on the traditional economic activity of the country, which

was based on agriculture and stock-breeding, the iron and copper mines, and trade...” (Cahen 1960: 664). The Mongolian conquest of autonomous, somewhat remote polities such as Hasankeyf did not result in a profound discontinuity in institutions, urban life, and material conditions at those places, but did result in an increase in the proportion of nomadic people and the reorganization of the countryside towards pastoral nomadism (Cahen 1955: 98).

Following the arrival of the Seljuqs and the fall of the Kurdish Marwanid dynasty based in at modern-day Silvan, east of Diyarbakir, the Upper Tigris region was controlled by a series of groups mostly holding limited territory (Sinclair 1989: 388-397). A brief foray into dynastic history shows the frequently shifting boundaries of local, often spatially non-contiguous principalities in the Diyarbakır area. Two local Ayyubid lines ruled until the Mongol conquests, one from Mayyafariqin (Silvan) and Jabal Sinjar, the other from Hasankeyf, Amid, and Ahlat. The Mongols conquered the Diyarbakır area temporarily in 1231, and definitively in 1259-1260, but the Ayyubids retained control of Hasankeyf until conquest by the Akkoyunlu (Bosworth 1996b: 72-74). From 1102-1232, an Artukid line ruled from Hasankeyf and Amid, until the Ayyubid conquest of 1232-1233. Another Artukid line ruled 1101-1408 from Mardin and Mayyafariqin (Silvan), until the Karakoyunlu conquest (Bosworth 1996c: 194-196). Historical documents of the Artukid period show a picture of tribal chiefs endlessly fighting over territory in the Diyarbakır area (Cahen 1935).

Pastoral migration depends most heavily upon the security of the countryside.⁷ The fact that many competing principalities were centered on Silvan, Amid, Hasankeyf and Mardin means that the eastern end of the Upper Tigris River Valley would have been at the heart of the

⁷ Historians criticize analogies with twentieth-century ethnographies for their lack of concern with this fact. Long distance transhumance has flourished within the territorial boundaries of many modern nation-states. Sometimes, as in the case of the nineteenth century Shahsevan (Tapper 1997) and tribes in the Upper Khabur during the late Ottoman period (Ur 2010: 13), pastoral nomadism flourished on the un-policed fringes of states and empires. However, in the past, greater insecurity resulting from wars, banditry, and brigandage by soldiers would have constrained transhumance cycles and encouraged pastoralists to settle in walled villages or near highland forts (as in the case of the sixteenth century Mahmudi in eastern Turkey and Naxçıvan (Reid 2002)).

frequently changing political boundaries in this period. In such an insecure situation, long distance nomadism could not have been generally possible in the area around Hirbemerdon Tepe, although it is unclear whether transhumant groups settled or moved elsewhere. Limited mobility at this time seems to have been a broad regional phenomenon, as the end of Mongol hegemony throughout the Middle East was characterized by great insecurity in the countryside as a result of widespread banditry (Roemer 1986: 153-154).

A recent analysis (Peacock 2010: 128-163) has convincingly shown the strong correlation between the location of the most fertile east Anatolian pastures and the areas first penetrated by the Seljuqs and has thus argued that the pattern and logic of the eleventh century Seljuq incursions were driven by the desire to locate new summer and winter pastures for supporting a vertically transhumant lifestyle (for more impressionistic versions of this idea, see Lindner 1983: 10-11; Vryonis Jr. 1975).⁸ The boundaries of early highland polities in southwestern Iran may be reflective of pasture requirements and the needs of herders rather than those of settled populations (Alizadeh 2010), and parallel arguments have been made for tribal polities in early medieval Anatolia. A territorial strategy aimed at consolidating control of far-flung seasonal pastures, was also characteristic of the Akkoyunlu confederacy's expansion in the fourteenth and fifteenth centuries, discussed below (Woods 1999: 54).

Despite a lack of explicit textual evidence, it appears based on their geographic expansion that transhumance may have been an important element in the boundaries of other Medieval principalities. The Marwanids, a Kurdish dynasty that controlled the Diyarbakır area from their capital at modern-day Silvan 983-1085 AD, on the eve of the arrival of the Turks, are not recorded as being of nomadic origin (Amedroz 1903; Blaum 1992; 1993; Bosworth 1996a: 89-90; Sinclair 1989: 385-388). However, they conquered an area stretching from the northern shores of Lake Van to Mardin (Ripper 2000: Kart 3) that encompasses a significant portion of the annual

⁸ On the other hand, Khazanov claimed that the Seljuq invasions were not premeditated, thought out, or planned in advance: "It was a chain reaction of events and the unexpected weakness of the Middle Eastern states which led to the creation of the Saljuq empire" (1984: 264).

range of transhumant pastoral groups known from the Akkoyunlu period, the Ottoman period, and the twentieth century. The logic behind the Marwanid territorial extent is typically argued to have been commercial trade routes (Ripper 2000: Kart 2). Historical sources do not mention transhumance as a motivating factor, but later nomadic tribes under the Ottomans simultaneously pursued herding and commercial trade. Control of Diyarbakır, Silvan, and Mardin in the southwest and Ahlat in the northeast would have provided the Marwanids secure access to some of the richest lowland and highland pastures in eastern Anatolia, and Marwanid historical documentation refers to pasture lands in Diyar Bakr (the Upper Tigris River Valley) and the area surrounding Lake Van (Ripper 2000: 349, Kart 6). While pre-modern political borders were not necessarily an impediment to transhumant herders⁹, consolidated control of seasonal pastures would have certainly been a more ideal situation, particularly in the case of large nomadic groups. The Marwanids' origin in the mountainous region near Lake Van and their eventual expansion into the plain around Diyarbakır suggest an effort to hold control over both highland and lowland resources, a political and economic strategy recently argued to have been characteristic of early nomadic polities in western Iran (Alizadeh 2010).

The above hypothesis about the Marwanids must be taken critically because in fact we do not know the pasture locations or transhumance routes of vertically nomadic groups in southeast Anatolia before the period of the Akkoyunlu confederacy, and after that, only in general outline. The influx of Türkmen tribes in the eleventh to thirteenth centuries certainly altered previous migration patterns, especially since the Türkmen tribes would have been in direct competition with the indigenous Kurdish tribes for pasture (Peacock 2010: 155-156), and there is little textual information on migration patterns before the Mongol incursions of the thirteenth century (Cahen 2007 [1949-52]).

⁹ For example, Arab tribes in northern Syria migrated in and out of the Byzantine borders in the eighth to tenth centuries (Eger 2008; Haldon and Kennedy 1980; Robinson 1996)

Set transhumance paths are likely a modern phenomenon attributable to the unprecedented territorial control achieved for the first time by nation-states in the nineteenth and twentieth centuries. Thus, frequent shifts in migration routes would have also occurred spontaneously. For example, the Artukid Döğer tribe is recorded as having originated in the Diyarbakır area, but by the fourteenth century their territory is recorded as having been located substantially further west in the area known as Diyar Mudar (Cahen 1968: 315; 2007 [1949-52]: 340-341). In addition, tribes frequently appear under different names within the changing constellation of confederations, so it can be difficult to confirm the continuity of certain groups' patterns (Cahen 1968: 315).

The migration patterns of the eleventh century were likely quite mixed, with some following the pattern documented in the Akkoyunlu and Ottoman periods between summer pastures on the plain of Pasin from Kınıs on the western fringes of the Manzikert plain and winter pastures in the so-called "Berriye" between Diyarbakır, Mardin, and Urfa. Alternative winter pastures for nomads in eastern Anatolia in the eleventh century included lands along the Black Sea coast north of the Pontic mountains (Johnson 1969: 20), the Kur Valley in Georgia, and lowland areas in the southern Caucasus from Tbilisi to the Mughan Steppe (Peacock 2010: 148).

Pastoral nomadism was likely practiced on a broad scale in southeastern Anatolia before the arrival of the Turks, but the Turks' arrival may have resulted in changes to the scale of sociopolitical organization among nomadic groups. Complex, politically influential tribal organization among horizontally transhumant pastoralists in the Syrian steppe is documented as early as the second millennium BC around the city of Mari (Fleming 2004), and while such early historical sources for the Upper Tigris Region do not exist,¹⁰ the pre-Turkish vertically transhumant herders of southeastern Anatolia likely also were organized tribally. However, the eleventh and twelfth centuries offer the earliest historical evidence for the large, powerful

¹⁰ This is a function of the fact that complex indigenous states with literate bureaucracies and traditions of historiography did not develop in the Upper Tigris or the southeastern Taurus until much later—this is in general true of highland areas, which is why more historical data exists on horizontally transhumant groups.

nomadic tribal confederacies that were to have a substantial impact on the southeast Anatolian society and economy until the early twentieth century (Planhol 1959: 525; Şahin 2006: 89). The most significant vertically transhumant nomadic populations in the Middle East before the arrival of the Turks were Kurds and Arabs¹¹, and an argument against the above statements would be that pre-eleventh century Kurdish tribes had at points become politically organized enough to create their own city-based polities. Examples include the Marwanids, discussed above, and the Shaddadids of Caucasia, who were also Kurdish (Peacock 2010: 152). A Kurdish “precursor tribal agglomeration” may have existed at Khoit in the Taurus mountains west of Bitlis from the mid-twelfth century, before the beginning of the Mongol occupation of the Lake Van region in 1243 (Sinclair 2001: 158). Answering the question of whether powerful nomadic tribal confederations existed in southeastern Anatolia prior to the arrival of the Turks is complicated by the fact that relevant historical sources of the early Islamic period are scarce and far too imprecise in their terminology for political and kinship groups. It is impossible to tell whether they refer to subtribal, tribal, or confederacy-scale groups (Crone 1993: 358; Robinson 1996: 434). However, the question is an important one not only for understanding tribal organization but also for understanding the capacity of transhumant tribes to control and defend their pasture areas.

While the Mongol incursions may not have resulted in profound discontinuities in urban life and material conditions, they did result in a reorganization of the countryside towards pastoral nomadism. By increasing the number of nomadic societies and the importance of a pastoral nomadic economy, the incursions set the stage for the establishment of polities where pastoral nomadic tribes constituted the base, in a situation closing resembling the enclosing nomadism model. Such polities characterized Anatolia and Iran for the next several centuries (Cahen 1955).

¹¹ From the period of the Turkish incursions onwards, historical sources draw a line between sedentary Turks and Christians on one hand and nomadic Türkmens and Kurds on the other. In fact, such ethnic and lifestyle boundaries are not as clear-cut as the sources would make it seem, as is discussed below.

The Akkoyunlu Period, 1378-1508

For the purposes of a pastoral-nomadic-focused history of the Diyarbakır region, the fifteenth century is a fascinating and unique period because the area was governed by a nomadic tribal confederacy centered on the city of Amid (Diyarbakır) known as the Akkoyunlu (“White Sheep” Türkmens), about whom there is rich indigenous, contemporary documentation in many forms (Woods 1999: 215-234). This documentation provides the earliest historical evidence for specific long distance vertical migration patterns that used pastures in the Upper Tigris region, and some of these patterns continued to be followed, albeit by different tribes, until the twentieth century. In this period there is ample evidence that political hierarchy drew from pastoral nomadic tribes and that polities expanded with the goal of controlling certain pastures and migration routes. This suggests that sedentary settlement in the Akkoyunlu domain existed within a broader and stronger pastoral sphere, in a pattern of “enclosing nomadism.”

By the second half of the fourteenth century, the Akkoyunlu claim to have been territorial princes in the Diyarbakır region, but their territory is difficult to define (Cahen 1968: 363), and their rival nomadic tribal confederacy, the Karakoyunlu (“Black Sheep Türkmens) ruled much of the region south of Diyarbakır beginning in 1349/50 (Sinclair 1989: 398). For several decades until they emerged victorious in 1467, the Akkoyunlu engaged in a territorial struggle with the Karakoyunlu.¹² From their original land holdings in east-central Anatolia, throughout the fifteenth century the Akkoyunlu solidified control of a large area that eventually stretched across northwest Iran, Azerbaijan, and eastern Anatolia (Woods 1999: 55, 94, 135). Their defeat of the Karakoyunlu and expansion east into Iran transformed them “almost overnight from a small group of nomadic clans warring over summer and winter pastures and the right to collect tolls from merchants in transit into an Islamic world power” (Woods 1999: 100). While the Akkoyunlu ruling class had long been sedentary and governed over large indigenous settled

¹² The origins of these two confederacies are unclear. For several hypotheses, see (Roemer 1986: 151-155)

populations of Armenians, Kurds, Arabs, and Aramaeans (Roemer 1986: 154), the majority of their tribal power base remained nomadic (Woods 1999: 15). Power was concentrated in the families of the nomadic military aristocracy, who routinely plundered the agricultural peasants (Khazanov 1984: 268-269), but did not drive them out or exterminate them (Roemer 1986: 154).

The eastern end of the Upper Tigris Valley was firmly within the heartland of the Akkoyunlu state—a triangle formed by Amid, Mardin, and Hasankeyf. Amid and Hasankeyf were centers of their power until 1468, when the court was moved to Tabriz (Figure 4.2). Major trade routes ran through Mardin, Savur, Hasankeyf, Siirt, and Bitlis, and thus the eastern end of the Upper Tigris would have remained somewhat isolated despite being located in the center of the Akkoyunlu heartland.

Control of pastures and migration routes appear to have been a major governing logic in Akkoyunlu territorial expansion. An early political strategy of the confederacy was to consolidate control of interdependent systems of mountain pastures in “Arminiya” and winter steppes in “Diyar Bakr” (the Upper Tigris River Valley and plain areas extending over to Edessa (Urfa)), Diyar Mudar (the Euphrates bend area, as far downstream as Raqqah), and Diyar Rabi’ah (steppe areas west of Mosul) (Woods 1999: 54). Access to summer and winter pasture areas depended upon Akkoyunlu control of both major urban centers and numerous smaller strongholds, including castles. These strongholds, while primarily for collecting protection and toll money, were also located strategically along the principal migration routes (Woods 1999: 29).¹³ The correspondence between the reported migration routes of the Akkoyunlu groups and trade routes in this period is not coincidental and probably indicates the intertwined dual-purpose nature of mobility: interregional trade and transhumance for the purpose of animal needs.

¹³ This fact seems to indicate a two-tiered settlement pattern described by Alizadeh as characteristic of nomad polities in western Iran. (Alizadeh 2010)

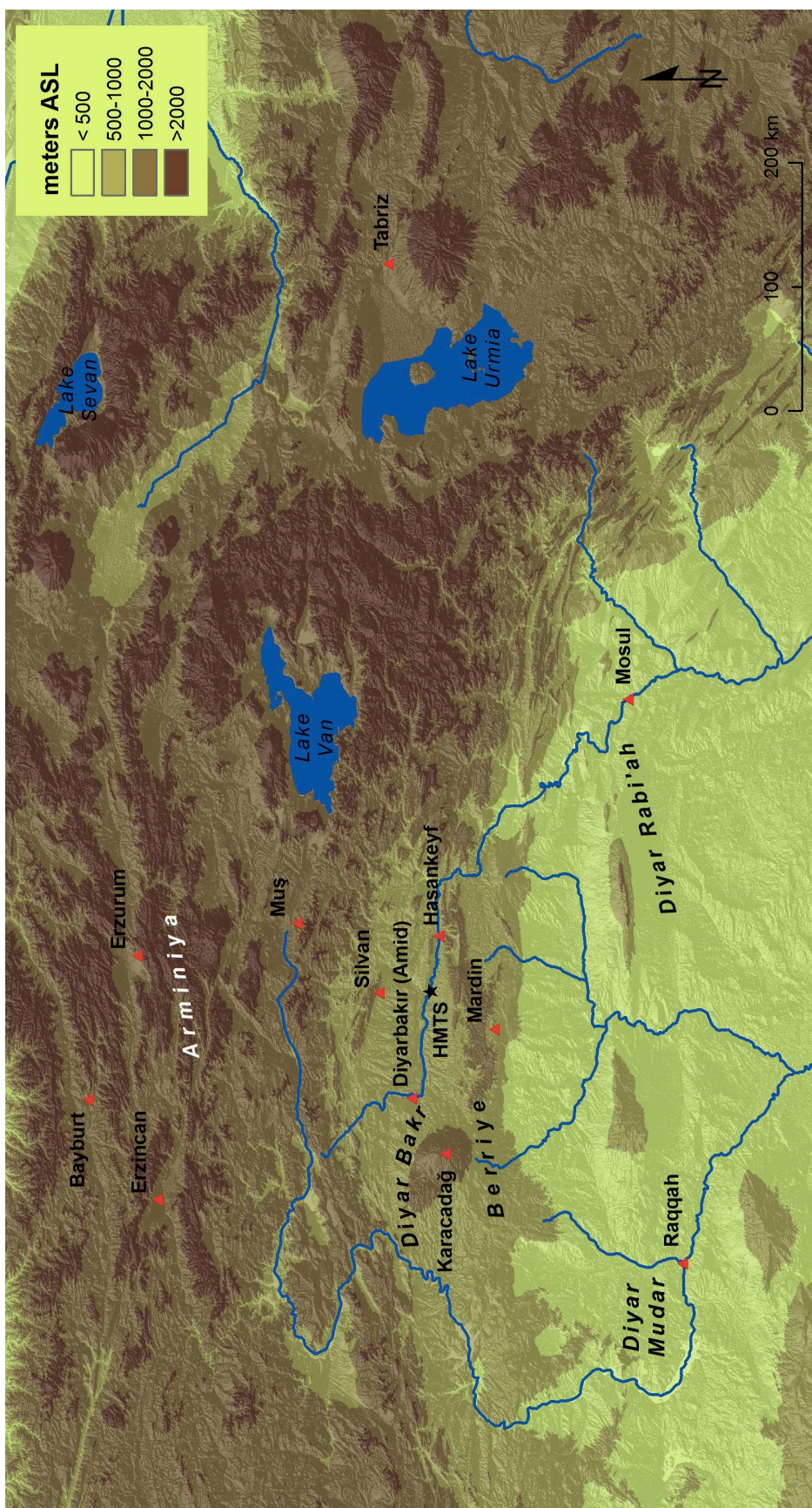


Figure 4.2: Sites and areas discussed in the text regarding history of the Akkoyunlu period in the fifteenth century AD.

Within the “Arminiya” to “Diyar Bakr” territorial range described above, there were at least four pastoral migration patterns. The first three involved the Akkoyunlu Türkmen confederates themselves. Like later Ottoman and twentieth-century groups, some Akkoyunlu groups used the Diyarbakır area as a winter pasture ground and migrated into the Taurus Mountains in the summer, a distance of 100-300 kilometers. Other groups followed a longer version of this route between summer pastures in the Taurus Mountains as far north as Erzurum and Bayburt and winter pastures in the Jazira as far south as Mosul and Raqqah, making the Diyarbakır region a transient camping area (Woods 1999: 29-30). The distances of these routes could be more than 500 kilometers. Among these were clans later called Bozulus by the Ottomans, who migrated between the area south of Mardin and Erzincan and Erzurum as well as Georgia and Iran (cited in Erhan 1992: 116-117; Sümer (Demirtaş) 1949: 39). A third group of Akkoyunlu nomad confederates followed ‘lesser’ migration routes from winter pastures in Diyar Rabi’ah to summer pastures on the slopes of the modern Karacadağ, southwest of Diyarbakır, a distance of 200-300 kilometers (Woods 1999: 64). Finally, one must consider the Kurdish tribes who were surrounded by and interspersed with the Türkmen groups. Some of these Kurds were also migrant pastoralists. A late sixteenth century Kurdish history, the *Sharafname*, describes a transhumant way of life for some Kurdish groups. For example, Kurds lived in hills on the edge of the plain of Muş, in a position from which they would have been able to migrate to summer pastures in the mountains above the plain (Sinclair 2001: 162). While the social and economic organization of the Kurds and the Türkmen was very similar, Kurdish groups were rarely incorporated into the larger Türkmen nomadic confederacies in the fifteenth century. Kurds maintained separate tribal hierarchies, territories, and fortified strongholds (Woods 1999: 91-92).

The distances of the Akkoyunlu migration routes require some discussion. Comparative scholars of twentieth century pastoral nomadism place the bi-annual length of most mountain-based Near and Middle Eastern vertical transhumance routes in a 100-250 kilometer range. There are a few exceptions to this: the Basseri of Iran and the Marri of Baluchistan, whose routes can

fall just above this range at slight more than 250 kilometers biannually (Johnson 1969: 160-161), as well as some members of the Qashqa'i of Iran, who traveled up to 500 kilometers between winter and summer pastures (Beck 1980: 328). While the figures for the first and third Akkoyunlu patterns described above are well within the average range, the figure for the second pattern is significantly above that range. In the Near East, this figure is only exceeded by the distance traveled by camel nomads in the Arabian desert, who can range over a thousand kilometers in certain years (Barfield 1993: 65-67).

Several hypotheses might explain the second Akkoyunlu pattern, which is described by numerous primary historical sources and therefore unlikely to be completely false. The first hypothesis takes the conclusions from the historical texts at face value and posits that such long migration routes were both feasible and desirable in a sparsely populated east Anatolian landscape by a population that 200-400 years earlier came from the Central Asian steppes. The figure of 500 kilometers compares favorably to distances traveled by some Kazakh pastoral nomads between the Caspian and Aral (Barfield 1993:141-142). The second hypothesis is that the historical sources state the overall range of all of the Akkoyunlu confederates combined, and that within this range different groups followed shorter migration patterns more comparable to those documented by the Ottoman records and twentieth-century ethnographers. A third, overlapping hypothesis is that migration routes might have been overstated, as a means of justifying territorial claims. Confirmation of one or more of these hypotheses will have to await dedicated study of ecological aspects of the relevant historical documents.

The rural economic situation at the end of the Akkoyunlu period (the end of the fifteenth and beginning of the sixteenth century) is unclear. Particularly following the shift of the capital to Tabriz, eastern Anatolia was politically, economically, and socially more closely linked with northwest Iran than with central Anatolia, as it would later be under the Ottomans (Cahen 1968: 361). The Akkoyunlu were defeated by the Safavids of Iran, who took over most of eastern Anatolia and held the Diyarbakır region 1507-1516 in the decade leading up to the Ottoman

conquest (İlhan 2000: 5; Sinclair 1989: 405). There has been no historical examination of how these events may have affected the pastoral migrations of the various Akkoyunlu tribal confederates or of the various Kurdish groups in southeastern Turkey, but we can assume that long distance mobility was curtailed. A clear picture of rural economy and transhumant society in the Diyarbakır region re-emerges almost immediately with the Ottomans.

The Ottoman Period, 1517-1914

Sources concerning pastoral nomadism are much more abundant and detailed for the Ottoman period than for the Akkoyunlu and earlier periods. Further, the length of the Ottoman period in southeastern Turkey and the stability of Ottoman bureaucracy resulted in a robust set of records that allow scholars to document historical events and processes in rural areas of southeastern Turkey at relatively fine spatial and temporal scales. A very different picture of pastoral nomadic groups emerges than that of the Akkoyunlu period: over time pastoral nomadic groups came to be completely enclosed by sedentary agriculturalists.

The Ottoman conquest of the Upper Tigris in 1517 was a positive development initially for local Diyarbakır tribal rulers, including Kurdish begs (lords) and Akkoyunlu aristocracy, who had been deposed by the Safavids and were reinstated by the Ottomans in an attempt to retain or gain the loyalty of these powerful groups and to ensure political stability and continuity in the region (İlhan 2000: 6, 17, 39, 41). While both the Kurdish rulers and the Akkoyunlu Türkmen aristocracy were no doubt sedentary, portions of their tribes remained nomadic, and both Ottoman reinstatement of tribal leaders and the cessation of conflict/eastward shift of the Turkish-Persian border must have been good for herders' pasture access in the Diyarbakır area.

In the long run, however, Ottoman control led over several centuries to the widespread containment and decline of vertically and horizontally transhumant pastoral nomadism across the empire. The sedentarization of nomadic tribes and the decline of pastoral nomadism was by no

means a unidirectional or monolithic process across the empire. Nomadism experienced several revivals, particularly at the end of the Ottoman period as the empire's power waned. The timing and sequence of sedentarization efforts and corresponding agricultural expansion varied by region according to geography, the strength of the Ottoman state, and the strength and political organization of the tribes involved. The processes and actions that changed pasture situations and camping patterns for transhumant tribes included not only the obvious sedentarization programs, but also taxes, wars, the assignment of specific migration routes and pasture areas, relocation at the hands of the government, agricultural expansion, and changing conceptions of state territoriality and private property. Long-term state policies and taxes significantly reduced the flexibility of pastoral nomadic land-use.

The review of Ottoman sources presented below is limited to documents published in modern Turkish or English and has two primary goals: to place the Hirbemerdon Tepe Survey data in their historical context and to reconstruct the sociopolitical contexts that caused the area to the east of Hirbemerdon Tepe to be used as pasture area. Three main issues in the texts are significant: 1) general trends in pastoral nomadic demography and land-use, 2) the identity, role, and migration routes of tribes in Diyarbakır area, and 3) the spatial extent of agricultural and pasture land in the Upper Tigris region over four centuries of Ottoman rule.

General Patterns and Trends in Pastoral Nomadism under the Ottomans

Tribes whose territories were governed by the Ottoman Empire engaged in transhumance practices that span the full range of possible variations in Near Eastern nomadism. In the north Syrian steppe and desert, the Ottoman realm incorporated horizontally nomadic Arab Bedouin tribes herding either sheep and goats or camels. In Anatolia and the Balkans, the Ottomans struggled with vertically transhumant pastoralists of both Turkish and Kurdish ethnicity. These groups mostly herded sheep and goat, but occasionally horses or cattle instead, and practiced a wide array of transhumant patterns, ranging from movements of several dozen kilometers to

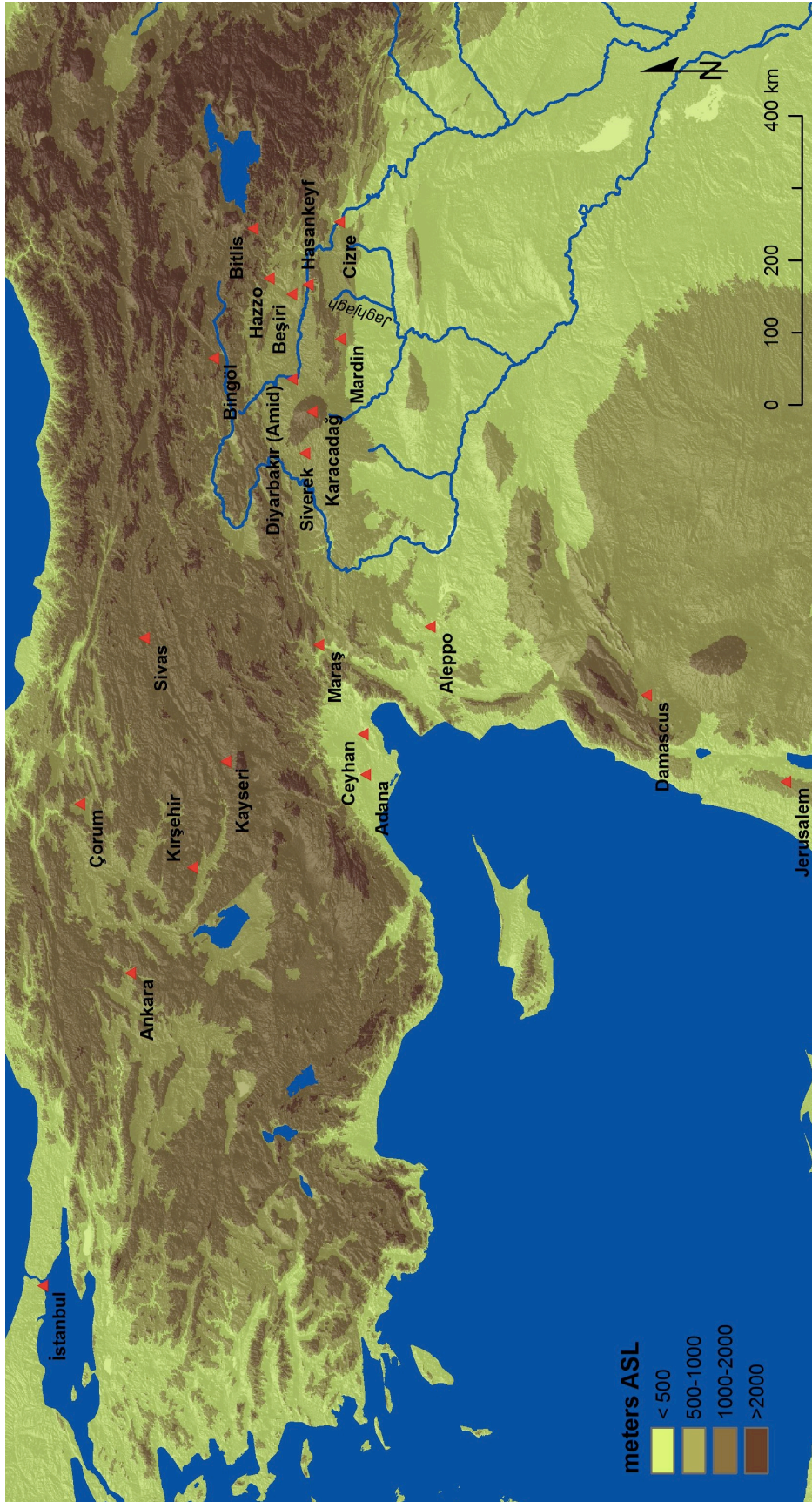


Figure 4.3: Cities and towns of the Ottoman period discussed in the text.

higher summer pastures to long 300+ kilometer-long migrations. Ottoman sources variously refer to nomadic tribes as Türkmen, Yörük (wanderer), or Kızılbaş (İnalcık 1994: 34). In general, there was a geographic and ecological distinction between Yörük and Türkmen. Yörük were found in western Anatolia and tended to practice shorter vertical transhumance, while Türkmen were found in eastern Anatolia and tended to engage in longer-distance vertical migrations. The Yörük in the west tended to practice a greater degree of agriculture while the Türkmen in the east tended to be more completely dependent on mobile herding for their livelihood (İnalcık 1994: 40). The rough geographical line between these two was around Kayseri and Kırşehir (Jennings 1978: 94).

The Ottoman government's detailed tax records (*defters*) and official written correspondence allow us to trace the fate of nomadic tribes in different parts of Anatolia. Numerous historians and anthropologists have examined the interactions between the Ottoman state and various pastoral nomad groups on the basis of such records, as will be discussed further below (e.g., Barkan 1939-41; 1943; 1970; Boran 1945; Faroqhi 1984; 1990; Gökbilgin 1948; 1957; Gökçen 1946; Göyünç 1968; 1969; Göyünç and Hütteroth 1997; Halaçoğlu 1988; Jennings 1978; Lindner 1983; Miroğlu 1975; Orhonlu 1963; Refik 1930; Ruben 1947; Salzmann 1995; Sümer (Demirtaş) 1949; Uluçay 1955; van Bruinessen 1988a; b; c; Wittek 1963; Yılmazçelik 1995). The importance of these *defters* for the study of pastoral nomad groups cannot be underestimated. Government scribes and provincial authorities systematically recorded detailed quantitative data on demography, sociopolitical organization, land use, geography, and production at regular intervals within defined administrative districts, permitting in-depth analyses of change over both space and time (Barkan 1970: 163-167). Nomadic tribes were registered with their tribal names and chiefs, the boundaries of areas in which they migrated, the names of local officials who were responsible for them (Kasaba 2009 : 107).

Nomads appear in the *defters* in a number of forms. In two standard types of cadasters, nomad groups either appear listed individually among villages and towns or registered in a

second section. The first type was typical for areas where nomads were considered more ‘invasive’ among settled communities, while the second was typical for areas like Diyarbakır where nomad groups had a more prominent presence (Lindner 1983: 75). A third, unique type of cadaster from the reign of Murad III (1574-1595) lists ex-nomad tribes that had been successfully settled by the government (Lindner 1983: 96). Most cadasters were presumably compiled during the summer, when roads were clear, and thus list nomads according to their summer locations (Lindner 1983: 97).

The *defters* show that in the sixteenth century, transhumant pastoralists comprised roughly a quarter of the total Ottoman population and up to 60% of the population in some districts of southeastern Anatolia (Hütteroth 2006: 19-21; Kasaba 2009: 18). The seven Ottoman administrative units with the largest nomadic populations in the early sixteenth century had a combined nomadic population of roughly 80,000 households (İnalçık 1994: 34).

Ottoman Policies, Mobility, and Settlement

Most literature on pastoral nomadism under the Ottomans argues that the Ottomans set out to contain and control nomadic tribes from the beginning of their reign, but a recent analysis argues that they initially encouraged and even expanded pastoral migrations because mobile tribes were a huge source of strength to the empire. They were important to its internal organization, to the maintenance and functioning of local and regional networks of production, trade, and administration, as has been discussed above. The government recognized nomads in their own administrative categories, and levied different taxes on them. Only with the emergence of ideas of territorially sovereign states with clear boundaries in Europe in the second half of the seventeenth century did the Ottomans become concerned with ruling a settled society (Kasaba 2009: 19-20, 30, 57).¹⁴

¹⁴ The turning points came with several pieces of legislation in the late seventeenth century, including the first sets of comprehensive settlement orders in 1689 and 1691 (Orhonlu 1963). These pieces of legislation not only aimed to settle the tribes, but also to register them and draft them into the military (Kasaba 2009:

Ottoman policy towards nomadic tribes was shaped by a number of competing factors. On one hand, the state frequently pursued policies of containment and restriction through taxation, monitoring, and forced sedentarization. Strategies of mediation and coercion included exile and military force geared towards transforming or destroying existing tribal structure, drawing a perimeter around the tribe and intervening little inside it, backing selected leaders in an attempt to extract taxes, and integrating and assimilating tribes into the empire's administrative structure through incentives such as trade subsidies and land allocation (Köksal 2006: 474-475). In many areas, pastoral nomads were in direct competition with sedentary agriculturalists over land, and the state preferred to encourage the placement of land under cultivation rather than pasturage since crops provided a more easily monitored and reliable tax income. The fierce independence of many nomadic groups and their tribal structure presented a serious challenge to Ottoman state authority. The tribes' mobility also lent them a threatening military capacity, an advantage that they seem to have frequently turned on vulnerable sedentary communities, travelers, and trade caravans (van Bruinessen 1988c: 35; Vryonis Jr. 1971: 268). Raiding particularly increased as pasture situations worsened for the nomads over time.

On the other hand, the Ottomans found it convenient to employ this independence and military prowess in the defense of their borders and trade routes, essentially contracting nomadic groups on the frontier to serve as buffers against outside groups and to serve as the state guards of mountain passes (İnalçık 1994: 41; Quataert 1994: 816-817). Large-scale specialized herding can be extremely productive under the right environmental and economic circumstances, and the Ottomans needed to supply their burgeoning urban populations with meat and other animal products. During the sixteenth century, pastoralists in southeastern Anatolia supplied livestock to all of the major Ottoman cities, including İstanbul, Aleppo, Damascus, and Jerusalem (İnalçık

66). It was not until the eighteenth century that the empire began to undertake comprehensive sedentarization programs. The permanent success of sedentarization programs did not occur until the nineteenth century (Kasaba 2009: 83). A series of regulations (1841-1867) aimed at settling all nomadic tribes in their winter pastures and demanded sedentary farming taxes from them; an 1858 law replaced communal property (including most pastures) with individual ownership (Kasaba 2009: 103).

1994: 161). From Diyarbakır, sheep in the sixteenth and seventeenth centuries were brought to İstanbul via Sivas and Çorum (Faroghi 1984: 56, 223-227, 240; 1994: 494-497; İnalçık 1994: 161). Cooking throughout Anatolia used clarified butter as its primary fat, and nomads were the main producers of this product (Faroghi 1984: 213). Pastoralists also monopolized land transportation throughout the empire, and some individuals even hired shepherds in order to engage full-time in the transport and trade business (İnalçık 1994: 39; Kasaba 2009). Nomadic tribes and merchants sometimes made mutually beneficial arrangements whereby the tribes provided safe passage to caravans and pack animals for fees (Quataert 1994: 816-817).

Certain characteristics of the tribes themselves shaped Ottoman policy towards them. A historical study of four nomadic tribes near Ankara argues that geographically bounded tribes and tribes with a strong internal hierarchy were settled via mediation between government officials and tribal authorities, but that geographically scattered tribes without a strong internal hierarchy confronted coercion and military action during their sedentarization processes (Köksal 2006). The government also learned from experience how to shape their sedentarization policies in a more effective way (Faroghi 1984: 286-287; 1994: 446). When early attempts to exile nomadic tribes to the Syrian deserts failed, the government developed a new strategy to settling the tribes in their pastures and along their migration routes (Köksal 2006: 476-477).

While the nomadic tribes represent an enormous amount of variation in characteristics and degree of political and military strength, by the mid-nineteenth century the eventual effects of Ottoman rule and state regulations on all were eventually the same. These include forced sedentarization, shifts in both territory and migration routes, and circumscription of their migration paths to set, predictable routes (Lindner 1983: 51). Military control over the countryside steadily increased and resulted in a sharp overall decline in the amount and quality of pasture (Quataert 1994: 769). The timing of these processes was varied from group to group and place to place, depending on Ottoman economic and political interests, tribal strength, and environment.

Ottoman settlement of nomadic groups was by no means a uni-directional process. Many governmental attempts at sedentarization of the tribes backfired and simply resulted in the movement of nomadic populations elsewhere (Kasaba 2009: 37). In many sedentarization programs, the government ended up giving more power and autonomy to some nomadic tribes because this was the only way it could reach into the countryside and control other mobile groups (Kasaba 2009: 54-55, 83). In this way, the government's actions strengthened existing tribal hierarchies or created new ones (Kasaba 2009: 78). The flexibility of the tribal structure also played a significant role. Whenever economic decline or conflict hit areas, tribes simply rallied their members and often resorted to a transhumant lifestyle (Kasaba 2009: 118).

Even in the nineteenth century, when the sedentarization of many tribes was well-advanced, significant fluctuations in nomadic populations continued. At the end of the nineteenth century, portions of eastern Anatolia that had been partially settled experienced an increase in pastoral nomadism when certain Kurdish tribes were selected by the government to serve as mobile militias defending empire borders. These militias, called the Hamidiye Cavalries, allowed previously weak tribal groups to extend their political influence and expend their pastoral migrations (Erhan 1997: 510-512; Klein 2002). After the Ottomans forcibly settled Türkmen and Kurdish tribes in southern Anatolia (Ahmet 1930; Orhonlu 1963), territories were left open in the region surrounding Adana, Ceyhan, and Maraş that were taken by a Yörük tribe, who were allowed to remain nomadic because they were not powerful enough to threaten the Ottoman state (Bates 1973: 34; 1980; Eberhard 1953; Gould 1973). The movements of the Yörük were tied to a larger trend of eastward movements of Anatolian pastoralists in the nineteenth and twentieth centuries (Cribb 1991b: 121; Planhol 1959: 529). Eastern Anatolia was the final "hold out" of pastoral groups originating from other part of the empire. As a result of the Crimean War in the 1850s, many Circassian and other Muslim tribes emigrated to Turkey from the Caucasus region. The Ottoman government allowed these tribes to select some of the best pastures, which caused considerable conflict with the mostly Kurdish tribes using these lands at that time. The

government took this as an opportunity to settle both the emigrant and the nomadic groups as agricultural communities in assigned locations (Safrastian 1948: 61).

Sedentarization and relocation are evidenced in the tax records in the form of the sudden appearance of new villages (Faroghi 1984: 201) and downward fluctuations in the amount of nomad-specific taxes, discussed further below (Jennings 1978: 93). The Ottoman government's definition of a pastoral nomadic group included tribal name and assigned winter and summer quarters, termed a "yurt" and meant to encompass both the encampment and the available pastures (İnalçık 1994: 37). Recognizing the tendency to be flexible in lifestyle, the state defined a nomad household as a settled unit (*reaya* or *yerli*) only after it had remained stationary and embraced cultivation for 10 consecutive years. Once a nomadic unit paid the agricultural taxes owed by such a settled unit, reversion was very difficult under Ottoman law (Lindner 1983: 55).

Taxes and Pastoral Nomadic Flexibility

The government attempted to generate revenue from the nomad tribes and to control their movements by taxing their possessions and migratory passage on certain routes and by assessing fines to those groups that left the boundaries of their assigned winter or summer quarters. Residence in an area was defined as three-nights' stay; after this the pasture fee or fine could be collected (İlhan 2000: 53; Lindner 1983: 63). Particularly in remote areas of the empire such as the Bohtan Su, government officials found it difficult to collect these taxes (Safrastian 1948: 61, 68). The effect of these taxes on the viability and wealth of pastoral nomad households is debated, but nomad-specific taxes were undoubtedly part of the process by which the flexibility was removed from pastoral nomadic land-use strategies.

As Linder (1983:x) has argued for the nomadic horse breeders of the Kayseri area, Ottoman registration of mobile people and imposition of taxes and fees may have removed the flexibility from systems that depended on plasticity and continued adaptation for survival. The general effect of the taxes was that they increased the minimum size of the herd needed for

survival. Because the nomads were required to pay a minimum tax regardless of the size of their herds, the tax reduced the animal holdings of poor nomads and nomads hit by bad weather or an epidemic to a herd size at which they could no longer maintain a pastoral nomadic lifestyle. Until the fifteenth century and the reign of Mehmet the conqueror (1444-1481), the sheep tax was levied in the summer or the beginning of autumn, after the lambs were culled. After this period, the tax date in many regions was shifted, so that the count took place in April and May, after the lambing. At this time of year, following the birth of young and before the losses of lambs on the migration to summer pastures, the herd was at its greatest size. This tax system took into account maximum revenues rather than herd sustainability, and was thus equally as effective as direct measures in causing the eventual sedentarization of nomads. Herds of less than 100 animals were no longer viable, and 300 became the typical minimum herd size across Anatolia; Lindner (1983:x) argues that this development was directly linked to the burden of Ottoman taxation. This herd size of 300 is far larger than a subsistence herd; among the Basseri studied by Barth, few families owned more than 200 animals.

More than anything else, pasture fees removed the possibility of crucial flexibility in nomadic herding systems. The government did not tax nomads for use of their assigned winter and summer pastures, but fees (*resm-i yaylak, kışlak, otlak*) were assessed if flocks strayed from these pastures or from the assigned routes between them. Even minor fluctuations in climate and usage can have dramatic effects on pasture quality, quantity, and distribution in a given year, and to maintain their herds, shepherds needed to retain the possibility to move the flocks onto better grazing areas, particularly on the migrations between winter and summer quarters. The fee was assessed if a group remained in one area for more than three nights. Under Selim I (1512-1520), the fee for summer pasture violation was 640 grams of oil, clarified butter, or fat from each tent, and under the reign of Suleyman (1520-1566), one sheep of best quality was added to this amount of fat. The fee for summer violation was either a year-old ewe or six a \mathring{c} kes (the value of a lamb), depending on herd wealth. While the cash amount of these fees were low, they could be

repeatedly assessed *ad infinitum* if a group decided to shift pastures, and could significantly impact herds, which were likely to already be weakened by the scarcity of pasture and longer distances of migration when caught in such a situation. Clearly the intention of the fees, taxes, and fines was to limit the ability of nomads to cope with changing environmental conditions, confine nomads to predictable, assigned areas, and preserve/enforce certain land use patterns.

A pen tax was also assessed in the fall during mating season when the sheep were penned and easy to count. This tax, *resm-i ağıl*, was 3 akçes under Selim I (Lindner 1983: 56-60). In Diyarbakır, the pen tax was called *resm-i yatak* and was one sheep of medium size from each herd of 300 or one akçe per 10 sheep for herds under 300 head (Lindner 1983: 73). In 1518 in Diyarbakır, the nomad-specific taxes included the summer pasture tax (*resm-i yaylak*), totaling 1 sheep from a flock of 300. By 1540 the Diyarbakır records list the *resm-i yaylak* as totaling 1 sheep from a flock and 200 dirhems of butter from each house (İlhan 2000: 30).¹⁵

The effect of taxes on pastoral nomads may have been different in the southeast because of the more commercialized nature of herding in this area in comparison to central and western Anatolia (Faroghi 1984: 223, 288; Salzmann 1995) and because of the existence of earlier tax codes. In eastern Anatolia, summer grazing fines for groups that deviated from their traditional pastures for more than three nights' stay (almost exactly parallel to the Ottoman regulation) were originally instituted by the Akkoyunlu ruler Uzun Hasan in the last quarter of the fifteenth century (Lindner 1983: 63). On the basis of an analysis of tax records pertaining to the Bozulus confederacy in the Diyarbakır and the Zulkadriye confederacy in the Maraş areas in 1540, it has been argued that nomadic households held on average just under 300 animals apiece. According to many twentieth century ethnographies, this was a viable herd size. Thus, Lindner's argument for the poverty of pastoral nomad households and the punitive intent of the Ottoman tax scheme does not seem to have been applicable to some groups. Furthermore, there are many other

¹⁵ In 1655, Evliya Çelebi visited Çapaqur, north of Diyarbakır, and witnessed a tribe being taxed by a Kurdish beg while passing to their summer pastures (van Bruinessen 1988b: 28)

indications in the tax records that nomadic tribes were able to accumulate wealth and in particular that many pastoral nomad households were better off than sedentary agricultural ones (Murphey 1984: 192-193).

Agricultural Organization and Expansion at the Expense of Pastoral Nomadism

To explain the overall decline and spatial restriction of pastoral nomadism under the Ottoman Empire, it is necessary to understand the corresponding expansion of agriculture under state monitoring. In Anatolia, peasants and pastoralists competed for land, especially following state-directed expansion of agriculture. The majority of analyses of rural economy and society are on Western Anatolia, but are still useful for understanding the Empire-wide relationship between agricultural and pastoral land-use. The following section attempts to establish if and how these patterns were valid for the Diyarbakır area.

To examine Ottoman agricultural organization, we will begin by defining several terms referring to different categories of land use: *çiftlik/raiyyet* (plural *reaya*), *mezraa/ekinlik*, *viran*, *kom*, *oba*, *divan*. The *çiftlik* or *raiyyet* was an indivisible family farm unit based on family labor and a yoked pair of oxen (*çift*), encompassing both cultivated and fallow fields (*tarla*) and typically 5-15 hectares in extent depending on soil quality (İnalcık 1994: 143-153). In the registers, a *mezraa* or *ekinlik* indicates a periodic settlement or a deserted village, including its fields (Hütteroth 1968: 169-170; İnalcık 1994: 162; Lindner 1983: 86, 101). In Karaman province, *mezraa* names incorporate the term *ağıl* (sheepfold) or the names of local nomadic groups, indicating that *mezraa* included sites used as pastureland. *Kom*, *oba*, and *divan* also designated small, often periodic, rural settlements associated with nomadic tribes. *Kom* specifically referred to a site of sheepfolds and shepherd lodgings in eastern Anatolia. *Oba* designated the grazing area of a nomadic household, and became a *mezraa* if the household engaged in agriculture. *Divan* indicated the tribal subgroup organizing the *oba* (İnalcık 1994: 162-163; Tanoğlu 1954). In the definition of villages, these units were considered to consist

minimally of *çiftlik* units of arable land, pastureland, meadows, harvest floors, fountain, and a cemetery (İnalcık 1994: 176). A basic division in land classification was drawn between village commons (pasture land) and independently owned agricultural fields.

The government had a vested interest in converting pastures into agricultural fields for both tax and security purposes (Faroghi 1984: 298; İnalcık 1994: 170). Because they were stationary, farming communities were far easier to monitor and tax than nomadic groups who moved around and therefore had a number of means of concealing their property or evading taxes altogether. In the era of mounted cavalry before vehicles, railroad, and airplanes, the knowledge of the landscape, independent attitude, and military capability of nomadic tribes presented a considerable threat to the Ottoman state. Nomadic tribal raiding of farming communities cut into government tax revenues, and extensive pasturelands limited where it was possible for agricultural communities to settle.

The state's distinction between agricultural land and pasture was based on the number of years since its cultivation. Once land was converted from pasture to fields, there were restrictions on its treatment. Only grain fields were state-owned (*miri*), and conversion of such lands to pastures, vineyards, or orchards, all of which were held as free property, was prohibited. Free-held land could only be left uncultivated three years before its cultivation was considered abandoned (İnalcık 1994: 155). *Timarlı sipahis* (grantees of land fiefs) took advantage of seasonal usage to argue that nomads had abandoned their pastures and to attempt to convert pastures into fields, thereby increasing their *timar* revenues (İnalcık 1994: 41).

The spatial extent of stable, state-backed sedentary agricultural communities constituted the main historical factor determining the regional and local landscape of pastoral nomads. Under state supervision and a steadily increasing population, the spatial extent of agriculture was greatly increased in the Ottoman period. This extension was achieved beginning in the period 1470-1570 in western Anatolia partly through the introduction of more efficient techniques and the stimulation of the market, but largely also through laws, taxes, and settlement policies that

guaranteed cultivators' security from the raiding of nomadic tribes and ensured that agricultural pursuits would prevail in the face of peasant-pastoralist land disputes. (İnalçık 1994: 158-159). In western Anatolia, these developments lead to the expansion of agricultural fields and the corresponding contraction of pastures in the sixteenth century and resulted in nomads being pushed to use more marginal lands at high altitudes (reviewed in Frödin 1943; İnalçık 1994: 40; Planhol 1958).

In the nineteenth century, agricultural expansion in central Anatolia was driven not only by the settlement of nomads and improved rural security, but also the arrival of *muhacir* (refugee) populations from recently-lost territories on the edges of the Ottoman empire. New settlements significantly decreased the amount of pasture area open to both pastoral nomad tribes and sedentary herding communities. In assigning refugees settlement locations, the government chose vast basin areas. The government did not take the traditional pasture rights of different groups into account, as these were not listed in the land registers since the government technically owned the pasture land. As security improved, the construction of railways made it possible to transport and sell surplus grain, and the government allowed communities to claim ownership of farmed plots, settled communities fragmented and agriculturally colonized new areas. This further reduced the available pasture (Hütteroth 1974: 23-24).

Identity, Role, and Migration Routes of Pastoral Nomads in Diyarbakır Vilayet

Sources specifically pertaining to Diyarbakır present pastoral nomad groups in all of the roles discussed above: as raiders, protectors of trade routes, military groups securing the Ottoman border, tax payers, and suppliers to the major urban animal markets. Within Diyarbakır province, tribes were active in raiding travelers and sedentary settlements. This apparently occurred not only in remote areas, but also near Amid itself (Salzmann 1995: 323). The Diyarbakır governors in the seventeenth century undertook frequent campaigns against the Eşni and Pozan ve Peysan tribes, who frequently attacked caravans in the Hasankeyf (Hisnkeyfa-Hazzo) districts and Bitlis,

east of the Batman Su (Kunt 1981; van Bruinessen 1988c: 35). Diyarbakır nomads marketed their animals in Aleppo in the nineteenth century (Cuinet 1892: 421), and this was probably the case for earlier periods as well (van Bruinessen 1988a: 41). Sixteenth century tax registers from Hasankeyf demonstrate that a large number of nomads used the city's bridge over the Tigris to transport their herds between pastures in the mountains and pastures in the steppe. On the basis of the sheep tax collected at this bridge, approximately 858,500 sheep must have passed over the bridge during a single tax cycle (Göyünç and Hütteroth 1997: 132). The 1558 cadastral survey of Bozok in Diyarbakır *vilayet* notes the inverse relationship between pasturelands and agriculture. In particular, the presence of nomads and the use of land as pasturage had prevented agriculture in certain areas (İlhan 2000: 47).

Pastoral nomad groups in Diyarbakır were registered by the Ottoman government almost immediately after conquest, in 1518 and again in 1540. The 1518 register lists by name ten Kurdish tribes, six settled and four nomadic, with one of the settled groups having two nomadic sub-groups (İlhan 2000: 26).¹⁶ The registers provide little information about the organization of specific Diyarbakır tribes, but the basic elements identified ethnographically and historically seem to be present. This organization was described by Orhonlu for the Türkmen: nomadic confederacies known as *ulus* or *goçer evlusi* were divided into tribes (*aşiret/kabile/boy*), then subgroups (*'cema'at/oymak*), and finally encampments, villages, or pastures (*mahalle/oba*) (İlhan 2000: 26).

From very early on, the Ottomans took a heavy organizational hand with the nomadic tribes of the southeast, creating the Bozulus and Kara Ulus confederacies of Türkmen and Kurdish tribes, respectively (İnalcık 1994: 35). These confederacies wintered in the Syrian desert and northern Iraqi Jazira and in summer migrated to areas between the Euphrates and the Murad

¹⁶ Of the ten tribes registered in Diyarbakır in 1518 and 1540, six are recorded as “cema’at-i ‘aşiret-i” (tribal subgroups): Keke, Reşi, Aluci Kuçer, Dögerni, Berazi, and Bociyan. These tribes, with the exception of the Bociyan, were nomadic. Four tribal groups recorded as “cema’at-i” (subgroups): Banuki, Baciki, Basiyan, and Zeylan. The Banuki and Baciki were nomadic. The Basiyan had two groups registered as nomadic as well as 16 villages. Zeylan was settled with nine villages (İlhan 2000: 37)

rivers, dispersing over an area of the Bingöl mountains between Erzincan and Erzurum (İnalçık 1994: 36). In 1540, the Bozulus confederacy consisted of 7500 households owning nearly two million sheep, the Kara Ulus about half this number, and other Diyarbakır nomadic groups 273 households (İnalçık 1994: 37). The Bozulus alone constituted about 10% of the province's total population at the time (van Bruinessen 1988b: 27; 1988c: 35). This proportion probably remained constant in the seventeenth century, with the Bozulus population being replaced (numerically) by new tribes in the south and southwest of the province (van Bruinessen 1988a: 41). However, based on geography, these tribes are likely to have been steppe/desert horizontally transhumant groups, and it seems likely that in the seventeenth century, vertically transhumant nomadism in Diyarbakır province must have been on the decline even if the total number of nomadic households remained relatively constant. As will be discussed below, by the late nineteenth century the number of horizontally transhumant households far exceeded the number of vertically transhumant households.

The nomadic tribes in Diyarbakır *vilayet* seem to have initially had a unique political position. While in neighboring Cizre and Bitlis to the southeast and northeast the considerable numbers of nomadic tribes were counted among the emirates (independent entities only indirectly governed by the Ottomans), the large nomad confederacies in Diyarbakır *vilayet* formed their own separate category. These confederacies appear in the *defters* as their own separate *sancaks* (directly governed administrative entities). However, this classification appears to have been only fiscal. Unlike other *sancaks*, they apparently had no military obligations and no official government leader. Their only contact with the state would have been in the form of taxes (van Bruinessen 1988b: 21-22, 27-28). According to the *defters*, there were three nomadic *sancaks* in Diyarbakır in the sixteenth and seventeenth centuries. The 'Aşayir-i Ulus (Bozulus) appears in records from 1527 and 1578-88. The Pesyan u Pozan (apparently located between the Tigris bend and the Batman Su) appears 1568-74, 1578-88, and 1632-41. The 'Aşayir-i Beni Tay (a Bedouin group mostly using parts of Syria and Arabia as pastures) appears 1578-88 (van

Bruinessen 1988b: 19, 21). Other tribes appear among the administrative divisions of Diyarbakır until 1653 (Yılmazçelik 1995).

The largest nomadic political group, the Bozulus, was a confederation of tribes formed by some of the descendants of the Akkoyunlu who still inhabited areas of eastern Turkey in the early Ottoman period. In the sixteenth century, more than 100 separate tribes formed the confederacy. These tribes collectively claimed more than 60,000 people and held around 2 million sheep. Their seasonal migrations took them from south of Mardin in the winter to Diyarbakır and Erzurum in the summer. Some tribes' migration routes extended as far as Iran and Georgia (Kasaba 2009: 24; Planhol 1959: 527).

In the late sixteenth and early seventeenth centuries, some groups of the Bozulus were pushed by the Ottoman state to move to central and western Anatolia due to increasing nomadic populations and a resultant shortage of pasture (Gündüz 1997; Şahin 2006: 110; Sümer (Demirtaş) 1949; Woods 1999: 190). The Bozulus may have been partially motivated to shift westward by commercial reasons, specifically to decrease transport-to-market costs (Faroqhi 1984: 223-224). Certain Bozulus tribes in the first half of the seventeenth century moved west probably as a result of political unrest and insecurity from Iranian military incursions. Besides occasional raids, by the mid-seventeenth century the nomadic tribes in general and the Bozulus in particular do not seem to have been the politically dominant factor that they are frequently assumed to have been (Refik 1930; van Bruinessen 1988c). Other important confederate tribes of the Bozulus migrated to Iran in the sixteenth and early seventeenth century (Sümer (Demirtaş) 1949).

The out-migration of large portions of the Bozulus significantly reshaped nomadism in eastern Anatolia. The vacuum created by the displacement of Bozulus Türkmen was partly filled by Kurdish nomads (Planhol 1959: 528-529). Kurdish groups had been confined to short-distance semi-nomadism within individual valleys during the Medieval period due to conflict and invasions, but during the Ottoman period these groups had expanded their territories and

migration routes, becoming long-distance vertically transhumant pastoralists. The sixteenth century sultans seem to have encouraged Kurds to expand their mobility in order to help secure the eastern frontier with the Safavids, particularly after many tribes of the Bozulus moved west. In return for their service as a militia, Kurdish groups were exempted from taxes. The dissolution of the large Türkmen confederacies in eastern Anatolia thus did not result in the end of long distance pastoral nomadism or of politically significant nomadic groups.

Discussions of transhumant pastoralism in southeastern Anatolia typically identify tribes and tribal confederacies as being exclusively Türkmen or Kurdish, reifying an idea of an ethnic divide that did not exist. There are a number of examples of nomadic and sedentary tribes of various ethnic backgrounds “becoming” Kurdish. Furthermore, some Kurdish confederacies included Christian tribes and clans (Sykes 1908). The assumption that all nomadic groups were either Türkmen or Kurdish and additionally Muslim seems unlikely. This is a particularly important point for the Upper Tigris River Valley and the Tur Abdin, which sustained substantial Christian populations of many sects until the early twentieth century (Sinclair 1989: 405-408). Though no nomadic or semi-nomadic Christian groups are known from Ottoman documents pertaining to the Tur Abdin/Mardin region, it has been suggested that at least some of Christian groups in this region must have been semi-nomads during the winter (Göyünç and Hütteroth 1997: 133).

The traveler Sykes described and classified nomadic and sedentary tribes across eastern Anatolia according to religion, ethnicity, appearance, stated origin, and geographical location. Although his overview is quite racist, he does provide some interesting demographic information concerning pastoral nomads at the end of the Ottoman Empire. The transhumant tribes with ties to the Diyarbakır area are parts of three groups within Sykes’ much more extensive classification:

- 1) Several semi-nomadic and nomadic tribes lived and migrated between the Bitlis Su and the Diyarbakır area via the Bitlis gorge (Zone B, class I). These tribes included the semi-nomadic Pouran (200 families), the nomadic Shaykhdodanli (? families), the nomadic Bekran (500

families), the Reshkotanli (500 families) and the Elia (? families), for a minimum of 1200 vertically transhumant families. 2) Transhumant pastoral tribes oscillated between the northern Jazira, the Karacadağ, and the Diyarbakır area, spending January-April on the lower slopes of the Karacadağ, April-May on the northern Mesopotamian plains, June-September near Diyarbakır, and October-December again on the southern plains (Zone C, class IA, class IV). These groups included at least 30 different individually named nomadic tribes totaling at minimum 5970 families, the semi-nomadic Ziřofkan tribe of the Karacadağ (2000 families), the semi-nomadic Daghbashi tribe located east of Siverek (? families), and the semi-nomadic Chichichieh (Kiki) tribe that wintered in villages on the Karacadağ and spent the spring and summer in the Jagh Jagh (1200 families). 3) The final category is much more tenuous. It includes only one group: the Mizidagh, a possible nomadic section of the sedentary Kurdish Mizizakh tribe in the Tur Abdin (Sykes 1908: 463-475).

The fact that Sykes found a much greater number of horizontally transhumant nomads than vertically transhumant ones in the Diyarbakır area must be attributed at least in part to developments following the initiation of the Hamidiye cavalry regiments in the last quarter of the nineteenth century. In the Diyarbakır region, these regiments were clustered along the Syrian border west of Mardin, and enrolled both settled and nomadic Kurdish tribes, especially tribes of the Millı confederation (Klein 2002: 357-358, 360).

Clues to the Spatial Extent of Agricultural and Pasture Lands in Diyarbakır

Ottoman tax records and administrative lists of villages provide clues to the shifting location and productivity of agricultural lands in the Diyarbakır region from the sixteenth to the twentieth centuries. Tax records provide information about the ratio of fields to pastureland. The changing number and hierarchy of villages and towns indirectly suggests changes in the agricultural fortunes of certain areas, which were necessarily linked to changes in the availability of pastureland.

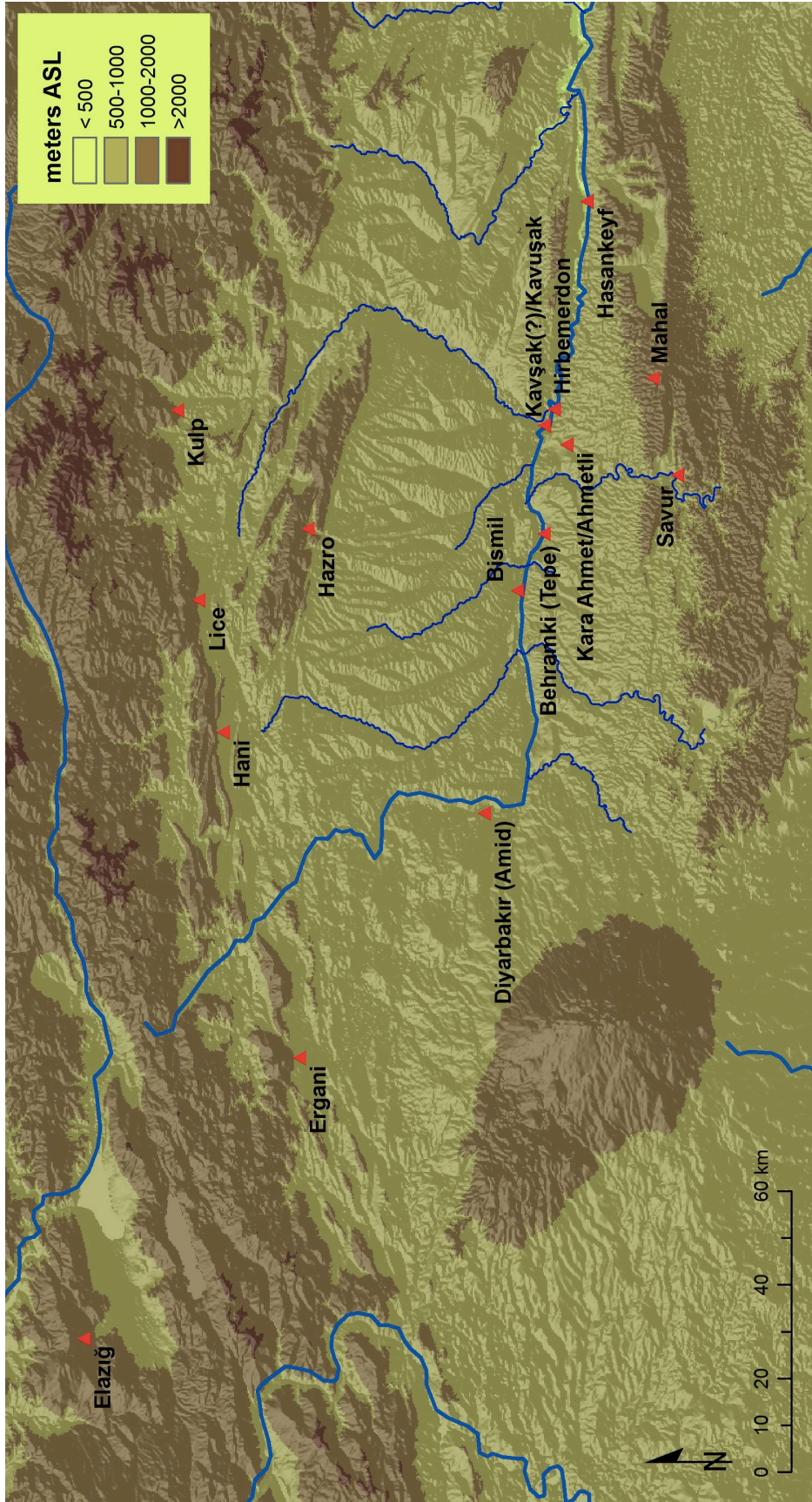


Figure 4.4: Cities and towns of the Ottoman period in the Diyarbakir area that are discussed in the text.

The large number of derelict lands (*viran*) reported in the early tax registers suggests that the extent of agriculture in Diyarbakır province following the Ottoman conquest was limited. Many of these lands were immediately assigned to fiefs (*timar*) with the expectation that the fief holder would revive the land, thus increasing its productivity and tax revenue. There are three possible explanations for this large number of derelict lands. First, the conflict in the region during the period 1514-1517 could have resulted a large number of deserted settlements. Second, the large number of semi-nomadic tribes in the region probably settled in villages during years where the climate and rainfall was particularly favorable, only to abandon these settlements during unfavorable years. Third, settlements located in areas with an underlying limestone geology (such as those of the region between Diyarbakır and Mardin) depend upon wells and cisterns rather than watercourses. Thus, villages can be easily abandoned, wells and cisterns constructed elsewhere, and the village can easily be re-established in the new location (İlhan 2000: 48-49).

Large tracts of open pasture in Diyarbakır balanced agriculture areas in the early Ottoman period, according to 16th century tax records (Göyünç and Hütteroth 1997). For the present purposes, the records of the Beşiri and Behmerd *nahiyeler* (subdistricts) of Hasankeyf *kaza* and the Kuh-i Mardin *nahiye* of Mardin *kaza* are the most relevant, as these are the subdivisions bordering Savur *nahiye*, the administrative subdivision in which the Hirbemerdon study area fell. Analyses of tax documents for these subdistricts show that the ratio of *mezraa* (abandoned fields and pasturelands) to village entities was 10:4, 6.5: 13, and 11.5: 16, respectively (Göyünç and Hütteroth 1997: 50). Although tribes were not necessarily nomadic, most nomadic groups were members of tribes. Compared to the subdistricts immediately surrounding them, the subdistricts mentioned probably had much more significant nomadic populations because they also had tribes (*aşiret*) listed separately among their financial units. This was particularly the case in Kuh-i Mardin and Behmerd *nahiye*, where the majority of the inhabitants seem to have been members of nomadic and semi-nomadic tribes. The Beşiri subdistrict, whose inhabitants belonged to a

mixture of religious groups and followed sedentary, semi-nomadic, and nomadic lifestyles, was probably the most representative of river plain fringes throughout eastern Anatolia (Göyünç and Hütteroth 1997: 295).

Anecdotal but direct indication of the state of agriculture in the Diyarbakır area comes from the writings of the traveler Evliya Çelebi, the *Seyahatname*. These writings indicate that agriculture in the seventeenth century in the Upper Tigris was limited and that there were expansive uncultivated areas available as pastures. At the time of Evliya's visit to Diyarbakır in April and May 1655, the Hirbemerdon survey area fell somewhere in along the western edge of the Hasankeyf *nahiye* (subdivision), one of the major Kurdish Emirates that had a history of independence under the Ottomans (van Bruinessen 1988b: 15, 18). Evliya described the areas between Diyarbakır and Mardin as stony wastelands (van Bruinessen and Boeschoten 1988a: 193-195). Additionally, he recorded that the area between Diyarbakır and Hasankeyf had many uninhabited districts (van Bruinessen and Boeschoten 1988a: 197).

From 1600-1850, there appears to have been a shift in the major zone of cultivation in Diyarbakır province from the south to the north of the province. This shift appears to have occurred for reasons of defense. Additionally, the northern part of the province had better communications and access to urban markets because of a denser network of urban centers. The number of fiefs (*timar*) declined in southern Diyarbakır. In Savur, the number of *timar* sharply decreased from 21 to 6 during this period (Salzmann 1995: 290-292). Agricultural revenue units were clustered densely around Amid and other administrative centers, particularly Harput (Elazığ), Ergani, and Hani, for reasons of transport and protection. Further away from the city, agricultural units took on a different character (Salzmann 1995: 288). In tribal and rural areas, the units were larger in scale and value. This shift in agriculture and the less fragmented nature of land divisions in more remote parts of the southern portions of the province must have translated to a greater availability of expansive pasture lands. Although Diyarbakır was very fertile for grain production, surplus could not profitably be exported to other regions until the

construction of railroads in the twentieth century because of high transportation costs (van Bruinessen 1988a: 39). This point is particularly relevant for the east end of the Upper Tigris River Valley, which was located significantly downstream from all of the major nearby population centers and markets in the Ottoman period.

Years	Number of Villages in East	Number of Villages in West
1733	142	115
1738-1739	120	85
1747	111	63
1758	94	60
1785-1797	183	219
1802-1803	86	147
1817-1826	44	143
1839-1842	113	120
1846-1847	68	74

Table 4.1: Villages administered by Amid over time throughout the later Ottoman period. Compare to 227, the number of villages in the subdistricts east of Diyarbakır (Bismil, Hani, Hazro, Kulp, Lice) at the time of the Turkish Republic’s 1964 Village Inventory.

	1871	1884	1967
Population	2669	2718	5223

Table 4.2: Population growth in the Behremki (Tepe) subdivision of Diyarbakır province from the late Ottoman period to the mid-twentieth century

The redivision and shifting of administrative units (Faroqhi 1990), the reclassification of certain settlements (İnalçık 1994: 166), and the number and location of villages can be used as proxies for economic development/decline and the extent of agricultural lands in the eastern part of the Upper Tigris River Valley during the later Ottoman period. The east end of the Upper Tigris River Valley is at the edge of the area covered by a study of Diyarbakır on the basis of Ottoman documents dating to the first half of the nineteenth century (Yılmazçelik 1995). The southeastern-most of the villages on the study’s map is “Kara Ahmet”, in the same location of the modern Ahmetli Köy, located at the edge of the Hirbemerdon Survey area. “Kara Ahmedli”

appears in the eastern village lists of 1785-1797, 1802-1803, and 1817-1826. We can not automatically assume that this always refers to a village at the location of modern Ahmetli Köy, as another village by the name of Kara Ahmet, located at a crossing of the Tigris west of the Savur Çay, is mentioned by a traveler in 1850 (Badger 1852: 52-54). However, the village of Kavşak, which appears in the 1839-1842 eastern village lists, may correspond to the modern village of Kavuşak and would suggest that there were indeed villages in the Hirbemerdon study region at points in the nineteenth century. Assuming that the lack of villages further east on Yılmazçelik's map is not a function of the study's boundaries or the administrative boundaries of the Ottoman record, Kara Ahmet may have formed the eastern boundary of agricultural land in the Upper Tigris River Valley sometime in the early nineteenth century. This boundary was likely a fluctuating one: Kara Ahmedli disappears from the village lists after 1826 and Kavuşak does not appear after 1842. The fluctuating nature of agricultural lands in the eastern Upper Tigris throughout the eighteenth and nineteenth centuries is suggested by the oscillations in numbers of villages, shown in the table above.

We can assume that agriculture spread into the east end of the Upper Tigris River Valley from west to east. The spread of agriculture could in theory come either from the direction of the Tur Abdin and Hasankeyf (from the east and south) or the direction of Amid (from the west), as both regions were agricultural centers from early Ottoman times. Topography, ease of access, and shifting administrative divisions would suggest that the latter direction. Hasankeyf ceased to be a *kaza* center after 1839 (Yılmazçelik 1995: 133-135, map III), implying settlement decline in the region to the east of the Hirbemerdon study area. Furthermore, the appearance of new administrative subdivisions with *kaza* centers at Bismil and Behramki (Tepe) in 1839 (Yılmazçelik 1995-135, map III) would seem to suggest an increase in agriculture in the area to the west. A degree of continuity in agriculture to the southwest of the Hirbemerdon study area is suggested by the continuity of Savur and Mahal (to the south) as *kaza* centers 1785-1848 (Yılmazçelik 1995-135; map III).

The Turkish Republic, 1923-present

Twentieth century agricultural and pastoral land-use has already been discussed somewhat synchronically from the perspective of the village inventories of the 1960s in Chapter 3; here I briefly discuss the specifics of settlement pattern shifts in the Upper Tigris area firstly to provide a more diachronic perspective, and secondly to demonstrate that many changes in rural land-use in the twentieth century are continuations of changes that began in the Ottoman period. The twentieth century in the Upper Tigris region witnessed the continued spatial expansion of agriculture, the sedentarization of many pastoral nomadic tribes, and shifts in migration routes and pasture areas caused by border delineation, ethnic conflict, and influxes of refugees from lost provinces of the Ottoman Empire. The present agricultural settlement pattern in the study area is product of social and demographic change related a very recent conflict, the war between the Turkish state and the Kurds in the 1980s and 1990s. This conflict also ended most long-distance pastoral migration. Up until then, the Diyarbakır area was one of the final refuges of pastoral nomads in Turkey.

Twentieth century changes in pastoralism under the Turkish Republic were largely continuations of processes that began much earlier, in particular the continuation of many Ottoman policies of containment and settlement of pastoral nomads as well as the expansion of agriculture under the centralized control of the state. As in the nineteenth century, portions of eastern Anatolia remained a refuge for the dwindling numbers of nomadic groups. Efforts by the government to create a modern nation state through re-organization of settlement and administrative units, population exchanges, ethnic cleansing measures, economic development, and improved infrastructure resulted in changing rural settlement patterns. The balance in spatial and political control shifted decisively towards sedentary groups making their living through agriculture and commerce.

Several events immediately following the establishment of the republic permanently changed pastoral nomadic migration routes and pasture patterns in the southeastern part of the country. In the 1920s and 1930s Turkey established firm borders with Iraq and Syria that permanently disrupted the migration orbits of many transhumant groups (Erhan 1997: 512; Planhol 1959: 530). The Turks did not grant nomadic groups from the Iraqi and Syrian steppes rights to northern pasture lands, and Iraq did not allow Kurdish tribes to migrate south (Safrastian 1948: 87-88). The 1924 Village Act turned many areas that had been used as pastures into the common properties of the nearest villages. This legislation made it necessary for pastoral nomadic groups to either change their pasture areas or pay high yearly rental fees to sedentary villagers for the temporary right to lands they had been using for decades (Erhan 1997: 305; 1997 : 513, 517). Settlement Act Number 2510, a law originally passed in 1934, was used in the 1980s and 1990s to force the settlement of remaining Kurdish nomads in the southeast, including the Beritanlı and Kosan¹⁷ in Diyarbakır and the Alikanlı in Siirt (Jongerden 2007: 115). Under such conditions, the portion of these tribes that remained nomadic no longer held control of land, and their “territories” can only be understood as the areas within which they traveled and rented their pastures (Erhan 1992: 155-156).

In the twentieth century, southeastern Turkey has experienced dramatic population and settlement shifts accompanied by major changes in land-use intensity. As a region whose population was composed of a significant percentage of ethnic and religious groups who are minorities within the citizenry of the modern Turkish state, the southeast was the target of campaigns to Turkify all of Anatolia. The anti-Armenian riots of 1895 and the deportation and killings of the Armenians in 1915 and Kurds in 1925-1932 left many areas depopulated and agriculturally devastated (e.g., Safrastian 1948: 85). Immigrants from lost territories of the

¹⁷ Jongerden lists the Beritanlı and Kosan separately, but Erhan’s study and Skogseid describes the Kosan as one of the kabiles or lineages of the Beritanlı, the other two being the Karakulak and the Molla Ömeran.



Figure 4.5: Sites and features of the twentieth century that are mentioned in the text.

Ottoman Empire had been pouring into Turkey for decades, and the definition of Turkey and the Balkan states in the 1930s resulted in further population exchanges (Jongerden 2007: 130, 180; Kasaba 2009: 123-139). A significant population of Bulgarian Turks was settled in Diyarbakır's Bismil ilçe, and like many *muhacir* (refugees), soon largely left the lands given to them and moved to the cities (Jongerden 2007: 270).

The present settlement pattern is largely a product of conflict in the last three decades, in particular the guerrilla war between the Turkish government and the Kurdish Worker's Party (PKK) from 1984 to 1993. Emptying the Kurdish villages was one of the primary Turkish objectives during this conflict, as a strategy for depriving the PKK guerrillas of their resource base. The war thus greatly accelerated the twentieth-century trend of population movement from the countryside to cities (Jongerden 2007: 283). More than 3000 rural settlements were abandoned, and a million to a million and a half people were dislocated across southeastern Turkey (Jongerden 2007: 288). Official numbers do not exist, but only about 25-30% of the villages in Diyarbakır province seem to have been re-inhabited by around 30% of their pre-war populations (Jongerden 2007: 285).¹⁸ Even before the war, southeastern Anatolia was dominated by small settlements and increasingly divided field patterns. The conflict resulted in the further fragmentization and "hamletization" of the settlement structure (Jongerden 2007: 296-297).

The conflict directly affected the remaining transhumant pastoralists in the region. As the tension was building in the 1970s, many Beritanlı stopped traveling to their winter quarters in the Diyarbakır region to avoid the unstable socio-political situation (Erhan 1992: 115). Military activity in the 1980s and 1990s prohibited groups living on the southeastern plains from taking their animals to summer pastures in the mountains (Jongerden 2007: 285). Even after the

¹⁸ 432 settlements were evacuated in Diyarbakır by 1996, with 159 of them reinhabited by the mid-2000s (Jongerden 2007: 226). The villages themselves additionally have greatly reduced populations. For example, the villages in the Hirbemerdon Tepe study region had the following populations in 1967 and 1973, respectively: Guzelkoy and Tepekonak: 201, 338; Kavusak, Kinik, and Sahinli: 143, 195, Ahmetli: 215, 350 (Diyarbakır ili 1967; Karasarlıoğlu and Beysanoğlu 1973). However, each of these villages today houses only a few families.

repopulation of the countryside in the late 1990s and early 2000s, animal husbandry was not resumed at its previous scale, as young men were afraid or not allowed to take animals to summer pastures (Jongerden 2007: 297).

Southeastern Anatolia had continued in the mid-twentieth century to be the final refuge of pastoral nomadism in Turkey. Geographic accounts of transhumant tribes in several southeastern provinces provide detailed information about the number of nomadic households, their migration and inhabitation patterns, and their interaction with sedentary communities. These studies show a significant decrease in the number of pastoral nomads in comparison to the demographic figures recorded by Sykes.

In the 1940s, Frödin described three groups of vertically transhumant tribes utilizing winter pastures along the Upper Tigris: the Cizre groups, the Garzan Su groups, and the Batman Su groups. The largest of these groups with the most tribes were those who wintered on the Cizre plain and summered in the mountains south of Lake Van: the tribes whose migration routes were described more than a decade later in great detail by Hütteroth. At the time of Frödin's study, these tribes included the Dau-dan (70-80 tents), Kheir-ga (55 tents), Taya-Ferhan (160 tents and around 1000 people), Du-dere, Kiçan, and Musaraş. The first three of these still lived in tents in winter, and the other three were not studied (Frödin 1943: 260). The tribes left their winter quarters at 400-500 meters of altitude around the end of May, reached spring camps at an altitude of around 2000 meters in early June, passed to summer camps at altitudes of up to 3200 meters where they remained until the end of August, and returned to their winter pastures in the Cizre plain by the end of September. The total distance of these journeys was 150-200 kilometers. Several of these tribes planted wheat in their spring pastures, which they harvested during the return migration in autumn. On the return journey, the tribes did not stay in these camps as long as they did in the spring because the autumn rains were short, and thus the new autumn vegetation was not as abundant as it was in the spring (Frödin 1943: 263-265).

The Garzan Su group included the Alikanlı, the De-dere, and the Gueşguli. Compared to the Cizre and Batman groups, the Garzan groups suffered the worst winters in their higher altitude pastures, which were located around the city of Garzan and in between the city and the Garzan Su at 750-1050 meters. They sometimes had to purchase straw from sedentary farmers in the area, as they did not grow their own grain in their winter or summer territories. All three tribes still lived in tents during the winter, and the tribe of De-dere was observed to inhabit the same camp the entire season. The De-dere left winter pastures at the beginning of May, passed through the city of Siirt, and then to the mountains around Kov (Qor) Dağ. The spring migration was not undertaken all at once, but instead the group frequently stopped for 15 days or a month in locations where they found good pastures. Their camps on Kov Dağ were at 2160 meters. Several weeks later, they continued on, traveling little by little to arrive on the north slopes of the Taurus and the lava plain of Rahwa between the Taurus and Nemrut Dağ. They returned in a three-week migration beginning in October, using the same route via Kov Dağ and Siirt (Figure 4.6).

The largest of the Garzan groups was the Alikanlı, whose routes were also partially mapped by Hütteroth and by Beşikçi in the 1950s and 1960s. In 1939, the tribe was composed of 200 tents in possession of around 1 million sheep. The Alikanlı migration route went further east than the De-dere. From Garzan they traveled to Siirt and Hasteri Dağ, where they established camps of 50-100 tents at locations on the north side of the mountain at 2200-2400 meters in altitude. Towards the beginning of July, they went towards the Mukus valley in a one week migration and entered the north part of the valley through a high pass (3200 meters), descending along the Khandirut Dere. After 50-60 days here, they returned to Hasteri Dağ, rejoined the small part of the tribe that followed a route closer to that of the De-dere, and returned in October to Garzan (Frödin 1943: 260-262) (Figure 4.6). At around 100 kilometers in length, these migration routes were quite short in comparison to those of the Cizre and Batman groups. Particularly in



Figure 4.6: Migration routes of the Garzan Su tribes as mapped by Hütteroth 1959 and discussed by Frödin 1943.

their spring locations at Kov Dağ and Hasteri Dağ, the pastures and settlements of the Garzan nomads and the sedentary villagers were in close proximity to each other. The tribes agreed to follow the exact same migration routes and used the exact same pastures each year in order to avoid conflict. According the nomads, hostilities regarding pasture rights had not occurred in this region since 1918 (Frödin 1943: 265). Although Frödin places the Alikanlı pastures solely in the Garzan region, when this tribe was studied in the 1950s and 1960s, some Alikanlı winter camps were found as far west as the Batman Su area (Beşikçi 1969; Hütteroth 1959).

The third group, the Batman Su tribes, most directly concerns us, as the location of their winter pastures is directly across the river from the archaeological survey area. Unfortunately this is also the group about which there is the least information: Frödin did not know the names of the tribes except for one close to the Batman Su, called Dambeli or Dumbeli, and he describes their migration routes on the basis of second-hand information. The Batman Su area and the east end of the Upper Tigris River Valley are also, regrettably, located at the edge of the areas whose migration routes were later mapped by Hütteroth and Beşikçi. In the 1940s, the Batman Su groups reportedly wintered between Diyarbakır and the Batman Su at 600-800 meters in altitude. The tribes still lived in tents all winter, and like those of the Garzan, sometimes fed their animals hay (Frödin 1943: 260). Their migration routes apparently followed the Batman Su north into summer pastures in the mountain to the west of Bitlis. In 1936, the authorities forbid them to summer in these regions, and they thus began to travel all the way to Bingöl (Frödin 1943: 262-263). This migration route is a straight line of 140-150 kilometers.

One tribe falling into this third group was not named by Frödin but has been examined by a number of subsequent studies in Turkish and English (Erhan 1992; Gülöksüz 1985; Köroğlu 1980). This tribe is the Beritanlı. Mentioned in documents as early as the 1920s (Erhan 1992: 111), they also appear in a late nineteenth-century travel account. In his 1899 trip through the Diyarbakır area, Percy describes an encounter with the “Bekeranli Kurds,” whose sheikh explained to him that they summered on the “Antogh Dagh” and wintered in the Diyarbakır

plains. The sheikh showed Percy sword scars on his arms as evidence of perpetual feuds with neighboring settled villagers, even though conflict was reduced by arranging summer and winter quarters ahead of time (Percy 1901: 127-128).

In the 1980s the Beritanlı migrated between the lowland summer pastures in the Diyarbakır-Mardin-Urfa triangle and highland summer pastures in Erzurum and Bingöl provinces, especially on the Şerafettin and Bingöl mountains. The definition of this territory depended on their political and religious affiliations and the availability of land. The fact that they are Sunni Muslims (the religion of the majority of the sedentary population) allowed them to move their pastures to different areas in the recent past (Erhan 1992: 156). While earlier in the twentieth century groups had traditional (even if not official) rights to specific pastures and camping locations, the Beritanlı in the 1980s did not have rights to any land.¹⁹ Though they usually headed to the same areas, they did not have definite places to camp every year. This lack of rights, combined with yearly lease renewals from municipalities and villagers, resulted in an unpredictable situation for some camping groups. However, other members of the tribe had been using the same places for around 30 years (Erhan 1992: 157-158). The living situation in their winter quarters was much more sedentary than that described by Frödin for the Batman and Garzan groups forty years earlier. Some Beritanlı spent their winters in permanent dwellings, while others used tents year-round. Not all families migrated as units with all their members, particularly when children were put into school (Erhan 1992: 162-163). Both their summer and winter pastures were becoming increasingly fragmented, causing camping groups to become increasingly smaller. This problem with land fragmentation was particularly acute in their winter pastures, as most low land in southeastern Anatolia was now held in private hands. Camps were quite small in the winter, consisting of no more than 6-7 households with 20-25 tents (5-8 of these being used for animals) (Erhan 1992: 172).

¹⁹ The Beritanlı began paying rents for their yaylas in the 1950s (Erhan 1992: 163).

Due to fragmentation of pasture tracts, nomadism became so difficult for the Beritanlı in the 1960s that they decided to apply for wholesale settlement by the government. This request was not granted for over two decades, in 1986 (Erhan 1993: 61). Today, the Beritanlı are largely settled in villages scattered along their former migration routes in Elazığ, Diyarbakır, and Bingöl provinces. By 1989, 228 families had settled in Diyarbakır villages (Erhan 1992: 184-185), two of which are in Bismil İlçe: Çeltikli and Tepekonak (Jongerden 2007: 115). The village of Tepekonak is located the center of the Hirbemerdon Tepe survey area, while Çeltikli is located approximately 10 kilometers upstream on the opposite side of the Tigris. With development related to the GAP dams and the disruption of recent decades, the prospect for grazing is approaching zero across the southeast, and almost no nomadic groups remain (Erhan 1997 : 513).

Conclusion

Pastoral nomadism has been practiced in the Diyarbakır area for at last 3000 years, and historical documents provide information on specific vertically transhumant pastoral groups in the area over the last 600 years. These documents primarily illustrate the changing sociopolitical relationships between pastoral nomadic tribes and sedentary groups, in particular sedentary and urban populations under the Akkoyunlu, Ottoman, and Turkish states. These states alternately constrained and encouraged seasonal pastoral mobility with changing economic and political situations. The long-term result of governmental policies under both the Ottoman Empire and the Turkish Republic has been the sedentarization of mobile tribes. Diyarbakır and the rest of southeastern Turkey were the last refuges of vertically-transhumant in Anatolia in the twentieth century. While some families still migrate today, long-distance transhumance by tribal confederacies largely ended during the Turkish-Kurdish conflict of the 1980s and 1990s.

Twentieth century migration patterns through the Upper Tigris may have originated in the in the fourteenth and fifteenth centuries. Akkoyunlu documents contain the first historical

descriptions of long-distance vertical transhumance patterns between the Upper Tigris River Valley and the Taurus Mountains that were followed by many different groups for the next 500 years, until the end of the twentieth century. The location and nature of various medieval principalities in southeastern Turkey suggests that long-distance vertical transhumance might have been practiced in earlier periods, but the earliest description of particular lowland winter and highland summer pasture areas of mobile pastoral tribes dates to the Akkoyunlu period.

Although general seasonal migration patterns show a degree of constancy, the identity of the nomadic groups following these patterns, specific pasture areas, and specific migration routes have frequently shifted. Over the last millennium, the Diyarbakır area has experienced significant changes in demography and land-use resulting from conflict, political boundary changes, agricultural expansion, population influx, and out-migration. It is difficult to trace backwards the existence of twentieth century nomadic tribes more than approximately 150 years.

However, the general ethnic configuration of tribes in the twentieth century Upper Tigris appears to have originated in the seventeenth century. In the sixteenth century, most of the vertically transhumant nomads using the Diyarbakır area were members of a Türkmen confederation tracing its history back to the Akkoyunlu. When this confederation relocated to western Anatolia in the seventeenth century, Kurdish tribes took over the long-distance vertical transhumance routes. From this period until the late twentieth century mobile pastoralists in southeastern Turkey were predominantly Kurdish.

The historical accounts suggest that the position of the surveyed campsites at the eastern edge of the Upper Tigris River Valley constitutes evidence for the long-term spatial, social, and environmental effects of Ottoman policies towards pastoralism and agriculture. One of the major trends in rural land-use in the Upper Tigris over the last 500 years has been the spatial expansion of agricultural fields and the corresponding spatial shift and contraction of pasture areas. Along the rivers in Turkey, pastoral nomads were increasingly forced to the upland edges of alluvial plains, into more and more marginal pasture areas. The Ottoman administrative divisions and

censuses of Diyarbakır and surrounding provinces suggest that agriculture expanded and intensified in the Hirbemerdon Tepe area beginning in the mid-nineteenth century, presumably shifting the areas available for extensive herding further and further east within the province.

Historical and archaeological datasets on pastoralism in the Upper Tigris Region are complementary to each other. Historical documents provide data on aspects of pastoral nomadism that are frequently difficult to reconstruct materially, including data on changing sociopolitical relationships between tribes and states, tribal ethnic diversity, and the particular routes followed by transhumant tribes during their annual cycles. However, historical documents typically present historical change from the perspective of urban, sedentary communities. Further, the historical documents provide very few systematic data on how pastoral nomads interacted with local communities and modified the environment in their seasonal pasture areas. The archaeological study surrounding Hirbemerdon Tepe, discussed in the next three chapters, provides this information by reconstructing local landscape organization surrounding pastoral campsites.

CHAPTER 5: METHODOLOGY OF THE HIRBEMERDON TEPE SURVEY

Introduction

Recording empirical archaeological data on pastoral nomadism requires pedestrian surveys away from settled areas (e.g., Hole 1979: 195). The investigation of local landscapes of pastoral nomads further requires a survey design intensive enough to document all surviving facets of a typically ephemeral material landscape related to herding and domestic activities. With this in mind, the Hurbemerdon Tepe Survey (HMTS) conducted an intensive pedestrian survey of the agriculturally marginal area at the east end of the Upper Tigris River Valley. In four field seasons (2007-2009, 2011), the project recorded campsites, inhabitation areas, and the suite of natural and anthropogenic resource nodes surrounding them (Laneri, et al. 2008; Ur and Hammer 2009).

The overall methodology and theoretical orientation of the survey follows that of many recent surveys in northeastern Syria and the Levant (e.g., Casana 2007; Ur 2010; Wilkinson 2004b). The major elements of this methodology include stratified, systematic coverage, the use of satellite imagery to increase coverage within the survey area and to extend spatial analyses beyond the survey boundaries, the employment of off-site approaches to address land-use issues, and the use of GPS, GIS, and other modern technologies for data collection and analysis. Other important aspects of this methodology include the empirical definition of “sites” as opposed to “background noise” (Gallant 1986), a palimpsest conception of the landscape (Crawford 1953: 51), including explicit recognition that modern and recent historical land-use are taphonomic processes that affect visibility and structure the preservation of the archaeological record (Wilkinson 2003: 41-43), and use of non-chronological data from surface artifacts (sherd size, condition, fabric classes, etc.) in concert with detailed spatial data to reconstruct aspects of land-use patterns.

A basic division of the survey area into the western river terraces and the eastern eroded uplands has already been explained in Chapter 3. This division is maintained throughout the this chapter, as basic differences in topography, relief, soils, and modern activity have resulted in different degrees of landscape preservation and site visibility, which in turn necessitated different methodologies.

Transhumant pastoralism involved interregional movement, but campsites consisted of ephemeral features whose archaeological recovery requires intensive coverage of small areas. Surveyors studying mobile groups face the challenge of examining local patterns while maintaining a regional outlook. The Hirbemerdon Tepe Survey approached this issue by using its intensive survey results as the basis for a regional study using satellite imagery and earlier surveys. To investigate the landscapes of pastoral nomads, Near Eastern archaeologists must incorporate intensive survey methods, expand coverage beyond alluvial environments, and focus attention on post-Classical settlement patterns.

Methodological Context of the HMTS

Among the majority of Near Eastern surveys the HMTS differs methodologically in the small size of its survey universe (Figure 5.1), its coverage of topographically uneven areas, its employment of pedestrian transects, and its recovery of artifact scatters through siteless approaches. In these respects, the project has greater affinities with the methodologies developed by survey teams in Greece and Italy. Before describing the HMTS' methodologies, it is necessary to discuss the development of intensive and siteless survey methodologies, explain several concepts necessary for understanding methodological and interpretive debates, and situate the project methodologically in relation to other projects in the Near East and Mediterranean.

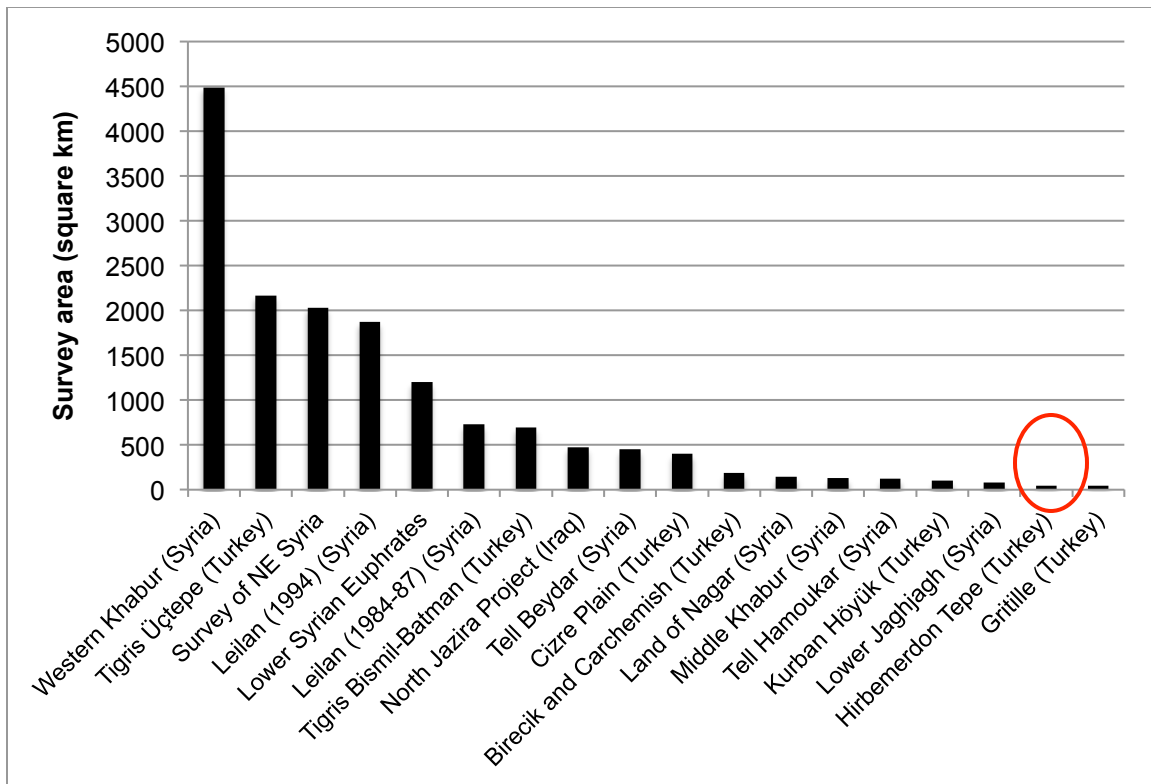


Figure 5.1: Chart comparing all clearly defined survey areas in Northern Mesopotamia. Survey size is not an indication of intensity, but the small size of the Hirbemerdon study area did encourage the development of a more intensive suite of survey methodologies than those typically employed.

Intensive Survey, Siteless Survey

Intensive and siteless survey methodologies emerged in the late 1970s and 1980s on one hand out of a processual shift in the level of observation from the site to the individual artifact and on the other through a post-processual awareness of the constructed nature of entities known as archaeological “sites.” Studying the whole landscape intensively and focusing on the recovery of more ephemeral traces of occupation also resonated with the ideas of the Annales school of economic and social history, as it implicitly attempted to weave the past of the masses into historical narrative and placed a greater emphasis on the role of the environment in shaping history (Bintliff 2000: 7).

Up until the 1950s and 1960s, archaeological survey consisted of prospection or reconnaissance projects concerned with using intuition to locate major sites for later excavation

(Ammerman 1981). Survey was a means to an end, not a methodology capable of independently contributing knowledge about the past. This view changed with the advent of New Archaeology. Binford charged the discipline with the development of scientific theories of cultural process—how and why cultures change (Binford 1962). This reconceived idea of what archaeology was and what archaeology should be accomplishing demanded a redefinition of the archaeological “site.” Sites ceased to be accumulations of features and came to be seen as products of behavior that had been guided by laws shaping the technical and economic dimensions of cultural systems. Binford’s idea that laws governed cultural systems changed archaeological survey. First, it suggested that studies of materials used and discarded among modern hunter-gatherers and traditional agriculturalists could aid in the understanding the diverse set of past behaviors that resulted in archaeological sites and therefore provided archaeological survey with a new avenue for refining interpretations. Second, it drastically altered survey methodology. The existence of laws suggested that full recovery of all materials on an archaeological site was not necessary to understand cultural process. Statistical sampling methods could be used to generate a subset of the data that were capable of standing in for the whole (reviewed in Banning 2002: 7; Collins and Molyneux 2003: 6). Instead of covering areas intuitively, this new idea of sampling required a systematic system of recovery and randomized decisions of which bits of land to cover.

Binford’s statement of ideal scientific research design promoted a new, more important role for archaeological survey. Most important was the realization that archaeological phenomena take place at different scales. Binford identified two different scales of sampling universes—the region and the site—and dictated that both should be surveyed for both ecological and cultural information (1964: 425, 433-435). In defining two sampling universes, Binford settled on a single unit of observation: the artifact. Binford defined the site as comprised of artifacts themselves and their spatial relations (1964: 429-431). It was the variable density of artifacts that archaeologists should concern themselves with in defining their subjects of study. Ethnographic and archaeological studies of hunter-gatherers and other mobile peoples played a

role in accelerating this development, as anthropologists realized that these people conceived of landscape in terms of paths, cycles, areas, networks, and resource nodes rather than a successive set of ‘settlements’ and therefore produced an archaeological record that was not confined to “sites” in the traditional sense (reviewed in Banning 2002: 7). Survey provided information complimentary to excavated information in terms of its scale and nature. Evidence of human habitation, activity, and civilization exists across the whole landscape rather than merely within the bounds of arbitrary site units. Methodologies examining terrain at a higher resolution were needed in order to recover sites at the lower end of the size spectrum as well as to recover evidence of “off-site” activity.

In the 1970s, post-processualism’s general attack on the objectivity and validity of “scientific archaeology,” in particular its emphasis on the personal biases of the observer and its rejection of the existence of natural laws governing culture, resulted in new attitudes towards sampling and archaeological “sites.” This approach recognized that modern-day researchers are caught up in their own social activities and power relationships that affect how they define and reconstruct archaeological sites. In other words, sites are not empirical entities, but instead constructed units with arbitrary boundaries.

To resolve this problem, some archaeologists in the 1970s began to undertake “nonsite”, “siteless”, or “distributional” surveys in the U.S. and Africa (Dancey 1974; Foley 1981; Nance 1980). Instead of defining a surveyed area as a set of discrete sites, the siteless survey conceives it as a bounded unit of space with a continuous distribution of artifacts with variable densities. In practice, this often involved recording the individual positions of artifacts or artifact densities in a particular area and then later defining areas of interest or “sites” empirically on the basis of distribution data. This labor-intensive approach was considered to provide less biased information about human activity and provided data that were sometimes used to define sites in a more quantitative way. These surveys opened a whole range of new issues. What should be the density threshold for defining site edges from “background noise” –the scatter of artifacts

resulting from movement across the landscape and activities such as the manuring of fields (Gallant 1986)? How should this threshold change depending on factors such as environment, and artifact type (e.g. Van Bueren 1991)?

A siteless conception of the archaeological record makes three important contributions to survey method and theory (Dunnell 1992; Dunnell and Dancey 1983). First, it recognizes explicitly that observation occurs at the level of the artifact. In collecting information on artifact distributions, it provides a dataset that may be reanalyzed according to different conceptions of what a “site” may be. Second, in focusing on artifact scatter, it is better able to focus attention on visibility differences (caused by terrain, plows, etc.) that may bias artifact distributions. High-density nodes that we might call “sites” arise from a combination of natural and artificial agents of transport, weathering, and deposition. These processes can be explained through actions on artifacts themselves. Third, it emphasizes that sites are not internally homogeneous and vary in according to function, activity areas, and population density.

The terms “intensive” and “extensive” are used throughout survey literature to refer to the amount of research effort expended per unit area within the survey “universe.” While this figure is rarely calculated precisely, and no scholar defines their use of the intensive-extensive terminology/continuum, the general classification of a survey as intensive or extensive seems to be generally sensed through a number of data and methodology features, including size of the total sampling universe (less than 100 square kilometers seems to be the definition of an “intensive” project), the morphology of the sizes recovered (topographically definable or urban sites=extensive, unmounded sites and sherd scatters=intensive), the mode of surveyor transportation (vehicular survey=extensive, pedestrian survey=intensive), and the nature of site definition (topographical or “common sense” definition=extensive, empirical definition=intensive). In reality, most surveys, including the HMTS, have methodological aspects in both of these categories.

Near Eastern and Mediterranean Surveys

With the development of intensive and siteless survey methodologies in the 1970s and 1980s, archaeological survey in the Near East and the Mediterranean set off on divergent methodological and theoretical paths. While Mediterranean archaeologists conducted ever more intensive pedestrian surveys concerned with the mapping of variable artifact densities in order to approach ancient landscapes as continuous entities marked by different types of locales, Near Eastern archaeologists largely kept to extensive vehicular surveys concerned with the identification of relatively large sedentary settlements and therefore tended to present a more discontinuous view of ancient landscapes.

The development of these two standard approaches—spatially extensive, low-resolution vehicular surveys in the Near East and spatially intensive, high-resolution pedestrian surveys in the Mediterranean—is a product of more than the idiosyncratic histories of archaeology in these two regions. Both approaches developed in ways that suited the terrain of their respective landscapes and ways that best served the most pressing research questions of archaeologists. Extensive vehicular survey developed and has remained popular in the Near East for so long because at its “height,” Near Eastern civilization thrived in alluvial landscapes and created mounded tells that are readily visible and topographically definable on relatively flat river terraces and the steppe. The vast majority of Near Eastern surveys still follow the model set forth in the Amuq plain over 70 years ago (Braidwood 1937).

In a parallel situation, intensive pedestrian survey developed in the Mediterranean as a method of dealing with uneven terrain, excavation permit difficulties, and even more significantly as a method of recovering the Hellenistic and Roman landscapes of most interest to classical archaeologists. Unlike the Bronze and Iron Age Near East, the settlement pattern of Hellenistic and Roman-Period Greece was dispersed, resulting in smaller, more ephemeral archaeological deposits in rural landscapes that could only be recovered through intensive fieldwalking. The favorable climate in Greece and the fact that these sites are generally unmounded allowed

thousands of years of farming to occur on top of them, further dismantling the sites and making a siteless approach necessary. The nature of these deposits, particularly their ephemerality, led not only to debates about site definition, but also to questions of surface visibility and artifact visibility/probability of preservation. The most influential contributions of Mediterranean survey programs have been questions of taphonomy and site transformation over time. Various projects have investigated issues such as the effects of modern agricultural plowing on site recovery (Ammerman 1985; 2004; Barker 2000; Dunnell and Simek 1995; Odell and Cowan 1987), the effects of sherd durability and visibility on surface visibility and artifact recovery (Mee and Cavanagh 2000: 103-105), and how the definition of archaeological collection units affects conclusions (Sullivan III, et al. 2007).

The explosion of theoretical and methodological publications in Mediterranean survey archaeology and the steadily increasing intensity of Mediterranean survey work has led to a somewhat teleological view of survey methodology: that more collected material, a greater intensity of coverage, and a greater number of recovered sites automatically indicates better data and better interpretations. The placing of surveys on an intensity of recovery chart, such as that by John Cherry (1983), seems to imply an eventual evolution of all archaeological survey toward the hyper-intensive Mediterranean model. Near Eastern archaeologists have countered this idea by arguing that the Near East does not methodologically lag behind the Mediterranean in the way that the “Cherry Chart” might imply. Mound-focused surveys in the Near East are biased against recovery of sites from certain periods, particularly post-Iron Age periods. As intensive methods are not needed to find tell sites, however, the recovery rate of Near Eastern surveys should be roughly comparable to that of Mediterranean surveys in the periods that settlement occurred on tells. Instead of methodological inferiority, the lower density of sites in the Near East reflects a real difference in settlement and demographic history (Wilkinson 2004a; Wilkinson, et al. 2004).

While Mediterranean archaeologists seem universally to take increasing intensity as a sign of methodological improvement, non-Mediterranean archaeologists have begun to criticize

Mediterranean archaeologists for their “myopia” (Blanton 2001). There is a trade-off between resolution of coverage and spatial extent of coverage; the hyper-intensity of Mediterranean survey coverage has led to smaller and smaller survey ‘universes’ that no longer qualify as regions. Specifically, areas less than 100 square kilometers cannot recover regional resource orientations (Blanton 2001: 628). A further criticism of hyperintensive surveys is their drain on effort and resources. In addition to the amount of funds needed for multiple seasons of large fieldwalking teams and processing time, intensive surveys strain storage facilities with increasing amounts of material (Alcock 2000). One of the strongest criticisms of intensive Mediterranean survey comes from the proponents of full-coverage survey, who take issue with the sampling designs necessitated by extremely intensive methods (Kowalewski and Fish 1990). These critics rightly question the validity of conclusions made from surveys covering very small percentages of their total ‘universe’ and express concerns that the intensive data gathered under such sampling designs is often useless for further analysis by other parties. Sampling designs, particularly ones involving small percentage of coverage, cannot provide data capable of explaining unique or rare phenomena, whether these are artifacts, site types, or relationships, and have serious problems resulting from edge effects (Kowalewski 2008: 249-250). In particular, such samples are unable to recover data appropriate for the investigation of functional networks above the level of the site (Kowalewski 2008: 270-271).

Avoiding Survey Myopia

What emerges from these seemingly esoteric methodological/theoretical differences are serious questions about how to reconcile recovery of the full range of human activity across landscapes (including small and ephemeral sites/artifact scatters often recoverable only via intensive techniques over small areas) with a regionally-oriented research design capable of contributing to archaeological and anthropological theory. However, in light of criticisms of

intensive sampling surveys discussed above (Blanton 2001; Kowalewski 2008; Kowalewski and Fish 1990), I address three ways in which the HMTS avoided “Mediterranean myopia”:

1. *By remaining focused on questions of broad anthropological significance.* Critics may be right in arguing that highly intensive methods militate against the treatment of questions on demography and socio-cultural evolution, but these are only two of many topics of broad anthropological significance that can make survey results of broad interest and applicability (e.g., Caraher, et al. 2006). Intensive surveys such as the HMTS are uniquely positioned to answer questions about diachronic trends in the intensity of rural landscape usage and the interactions between sedentary and mobile peoples.
2. *By covering a large sample of the “survey universe.”* By choosing methods that are intensive enough to recover the rural pastoral nomadic phenomena the HMTS team was interested in studying yet extensive enough to provide near-total coverage of the relevant part of survey universe, the HMTS produced a robust dataset. The shift to a less intensive methodology in the upland area was only made after several tests and comparisons of the two methodologies in upland areas suggested that the less intensive methodology did not result in a loss of resolution or valuable data.
3. *By facilitating comparisons between the small survey area and work in the broader region.* The HMTS results are integrated with results from the previously conducted salvage surveys (Algaze, et al. 1991). It is common for extensive reconnaissance-style surveys to lead to smaller, more targeted, systematic, question-driven surveys in many parts of the world—that is, for intensive studies to serve as a follow up to regional study. However, a sustained, dialectical back and forth between two widely different scales of survey might provide small-scale intensive surveys with a broader focus and in a sense, allow us to extrapolate and perhaps eventually to test results from a small-scale survey such as the HMTS in the broader region.

Survey in Turkey and Northern Syria/Iraq

Surveys in northern Syria and Iraq by Tony Wilkinson and his colleagues and students have been among the most methodologically rigorous in the Near East. These surveys are extensive by Mediterranean standards, but consider many of the question about geomorphology, surface visibility, effect of modern land-use on archaeological preservation and units of recovery raised by Mediterranean and American surveys. The Wilkinson suite of methodologies have included radial transects, off-site sample squares, and topographic units on mounds. These surveys employ satellite imagery and systematically consider various types of sites with non-mounded morphologies as well as off-site landscape-scale phenomena such as hollow ways, irrigation canals, and manuring scatters (Casana and Gansell 2005; Ur 2010; Ur and Wilkinson 2008; Wilkinson 2004b; Wilkinson and Tucker 1995).

Asia Minor geographically links the Mediterranean and Near Eastern worlds and thus bridges Classical, Levantine, and Mesopotamian archaeology. In a parallel fashion, survey archaeology in Turkey shows a blend of the extensive and intensive methodologies typically employed by these different groups of archaeologists. In the last 25 years, a number of “site hinterland” surveys have employed intensive methodologies in the southeastern part of the country. These survey universes, like the HMTS, are usually defined by the General Directorate of Monuments and Museums of Turkey as incorporating the contiguous territory within five kilometers radius from excavated sites. The resulting survey universes are thus far smaller than the area typically undertaken by Near Eastern surveys, encouraging landscape archaeologists to turn to Mediterranean approaches. Within the Karababa dam zone, four such surveys were undertaken surrounding Gritille (Stein 1998), Kurban Höyük (Wilkinson 1990), Lidar Höyük (Gerber 1996), and Titriş Höyük (Algaze, et al. 2001; Algaze, et al. 1992). The survey surrounding Gritille on the Euphrates north of Urfa employed pedestrian transects at 20 meters spacing, oriented coverage according to the pattern of watercourses, and sampled multicomponent sites with 10 X 10 meter collection units. It also recorded modern herding and

cropping patterns, low density scatters between settlements, and subunits within larger site and considered the larger scale regional system surrounding the 43 square kilometer survey area (Stein 1998: 257-260). The Kurban survey on the Euphrates northwest of Urfa covered 100 square kilometers, and was an early survey employing the methodologies described above as the Wilkinson suite (Wilkinson 1990). Intensive, siteless methodologies have reportedly been employed by the Avkat and Göksu Archaeological Projects, in central and southern Turkey, respectively. These teams have covered their landscapes with transects with 15 meter spacing, tallied artifact counts every 15 meters, and used interpolation to define site-level concentrations (J. Newhard, personal communication). The Kyaneai Survey in southwest Turkey has applied intensive pedestrian transects to a topographically uneven landscape in order to recover small farmsteads, graves, tumuli, cisterns, threshing areas, olive presses, animal corrals, ancient roads, caves, terraces and other types of sites and features typically missed by extensive surveys (Kolb 2008: 13-15, 236-253). Early experiments in intensive surface collection for the purposes of defining intra-site artifact variability were undertaken on two mounds in Diyarbakır province (Redman and Watson 1970) and similar work has continued for the purposes of defining and dating the lower towns of mounded sites (Batiuk, et al. 2005; Casana and Gansell 2005; Köroğlu and Kozbe 2003; Parker, et al. 2001; Peasnall and Algaze 2010).

The vast majority of surveys are much more extensive in their approaches, however, and have only systematically targeted topographically distinctive sites and monuments located on alluvial plains. This is especially true of salvage surveys conducted over thousands of square kilometers in the southeast over lowland terrain adjacent to the Tigris and Euphrates that will be or has already been affected by the various Southeastern Anatolian Project (Güneydoğu Anadolu Projesi—GAP) dams' reservoirs and corresponding irrigation programs (Algaze 1989; Algaze, et al. 1994; Algaze, et al. 1991; Ay 2001; Blaylock, et al. 1990; Kozbe 2008; METU Faculty of Architecture 1967; Özdoğan 1977; Serdaroğlu 1977; reviewed in Ur 2011; Whallon 1979; Yardımcı 2004). One exception is the Adıyaman survey, which also covered some upland areas

between drainage systems (Blaylock, et al. 1990). Other similarly mound focused surveys outside of salvage zones that have covered large areas and have not employed non-site methodologies include the Bayburt Province Survey in Northeast Anatolia (Sagona and Sagona 2004) and the Üçtepe survey near Diyarbakır (Özfirat 2005). Some surveys have incorporated a mixture of extensive mound-focused and intensive offsite sampling methodologies. The Paphlagonia Survey in north-central Turkey explored 8454 square kilometers in an extensive vehicular fashion, but followed up on several questions with non-randomly chosen ten 40 square kilometer sample areas. In these areas the survey achieved 6-10% coverage with siteless methods using approximately 10-15 m transect spacing (Matthews 2009). The Central Lydia Archaeological Survey investigated regional Lydian and Persian period settlement patterns by targeting tumuli over the 12,950 square kilometers of the entire Turkish province of Manisa, but followed this extensive approach with intensive offsite surveys around the identified tumuli (Roosevelt 2006). Survey projects, historians, and excavators have increasingly turned to satellite imagery in order to examine landscape features (Algaze, et al. 2001; Comfort, et al. 2000; Creekmore 2008; Di Nocera 2008; Kennedy 1998).

The majority of Anatolia is composed of highly uneven terrain, but most archaeological surveys have focused on relatively flat plains. Upland areas benefit from intensive survey designs because of the divided landscape and the tendency for many archaeological sites to be topographically indistinct. The Paphlagonia and Amuq surveys adopted intensive methodologies to sample upland portions of their respective study areas (Casana 2007; Casana and Wilkinson 2005: 27; Matthews 2009). Upland areas were also surveyed in the area surrounding Kurban Höyük (Wilkinson 1990: 61).

Previous Research in the Upper Tigris

Until recently, the Upper Tigris remained one of the least-known plains of northern Mesopotamia. The Southeastern Anatolia Project, a major development scheme by the Turkish government to provide massive amounts of water for irrigation and hydroelectricity for industry through dams on the Tigris and the Euphrates (Altınbilek and Akçakoca 1997; Ünver 1997), initiated the current wave of archaeological projects in the region. Floodwaters and changes in land-use resulting from the GAP posed a significant threat to the rich archaeological record and traditional rural culture of southeastern Turkey. Thus, the Turkish government began to encourage archaeological survey and rescue excavations in areas of the southeastern provinces that would be affected (Tuna, et al. 2004). Adequate archaeological investigation of impacted areas was a condition set forth by many of the foreign financiers of the dams (Shoup 2006).

As the Upper Tigris Region falls within the flood zone of the Ilisu Dam, the areas along the Tigris and Batman Rivers have undergone multiple rescue surveys, most extensively in 1988-1990 (Algaze, et al. 1991) (Figure 5.2). Violence between the Turkish government and the Kurdish Worker's Party (PKK) prevented archaeological work in southeastern Turkey throughout most of the 1990s and prevented the survey material gathered from areas along the Tigris (stored in the Mardin Museum and subsequently in the Diyarbakır Museum) from being studied. Numerous archaeological teams commenced survey and excavation work in the Diyarbakır region in the late 1990s and early 2000s.²⁰ The Ilisu Dam was originally scheduled to close in 2010, but progress has been delayed multiple times due to funding problems. In June 2009, the European firms backing construction withdrew their support after Turkey failed to meet many of the archaeological, cultural, and environmental conditions for funding. The Turkish government

²⁰ Salvage archaeology began in 1997 at Ziyaret Tepe, in 1998 at Salat Tepe, Gre Dimse, and Hasankeyf, in 1999 at Boztepe and Talavash, in 2000 at Kenan Tepe, Giricano, Müsülman Tepe, Aşağı Salat, and Kortik Tepe, in 2001 at Hakemi Use and Kavuşan Höyük, in 2002 at Yenice Yanı #1, and in 2003 at Hirbemerdon Tepe.

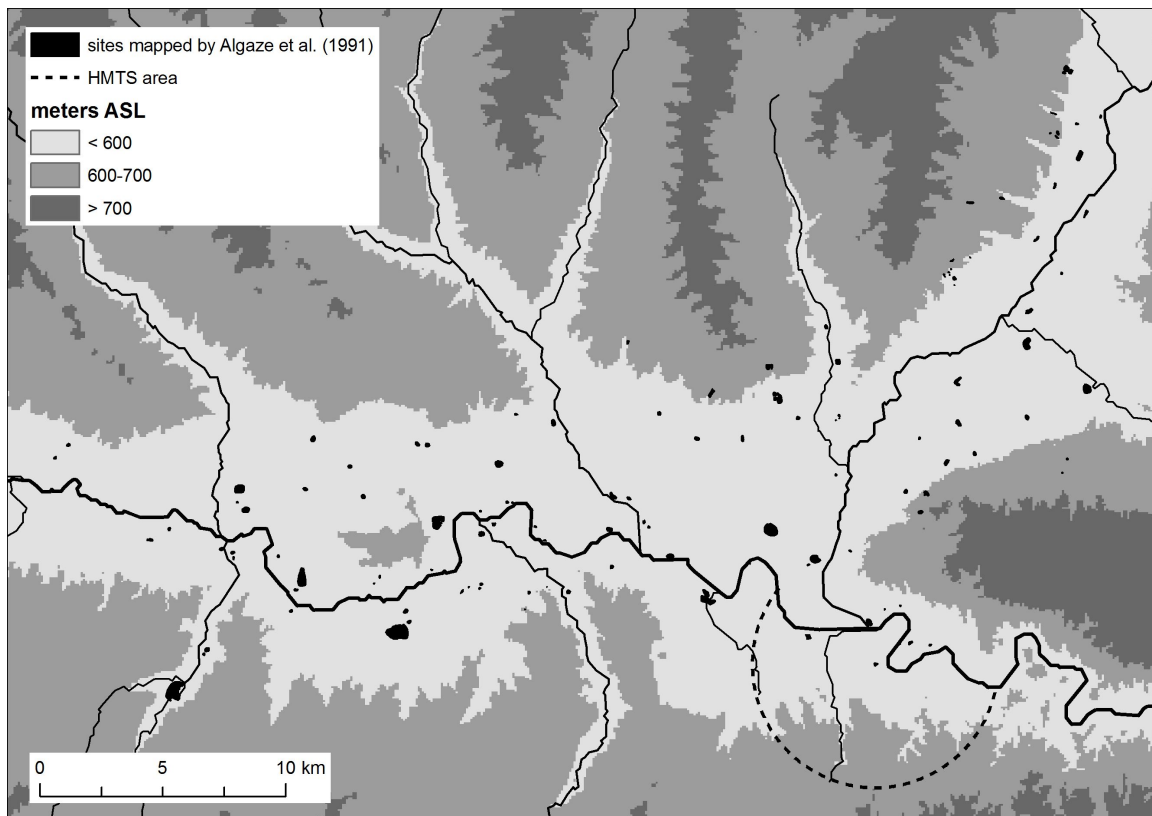


Figure 5.2: Position of the HMTS in relationship to the sites mapped by Algaze et al. (1991) along the Tigris River and the Batman Su in the eastern Upper Tigris River Valley between Bismil and Batman.

immediately stated their intention to build the dam independently and to recommence construction in July 2009. As of December 2009, estimates set completion for 2013 and flooding height to 540 meters (Elci 2009).

The original salvage survey covered lowland areas along the Tigris and its tributaries that were slated for flooding. These areas were along the Tigris between Bismil and Batman, the Tigris between Cizre and Silopi, and portions of the lower reaches of the Batman, Garzan, and Bohtan Sus. The final publication of this material is pending. Syntheses and comparisons of the Iron Age settlement patterns in the various zones of the salvage survey were published in studies on Neo-Assyrian impact in southeastern Anatolia (Köroğlu 2002; Parker 2001). Here we are only concerned with the Bismil-Batman portion of the dataset, part of which was re-surveyed in 1999,

2000, and 2002 for archaeological (Ay 2001; Köroğlu and Kozbe 2003) and geoarchaeological evidence (Kuzucuoğlu 2002). As it was designed to target sites endangered by the dam, the salvage survey covered only the river terraces low enough to be impacted by floodwaters, employed a vehicular survey methodology, and relied on topographical maps and local informants. The extensive nature of the survey, the methodology, and the limited time period available for fieldwork meant that the vast majority of sites collected were of a single morphological class: topographically visible mounds (tell, tepe, höyük, gre, hirbe) typically representing sites of long-term sedentary habitation and Paleolithic sites consisting of stone tool scatters on ridgetops. Later surveys have contributed sites of other morphologies to our knowledge of the settlement record in the Upper Tigris Basin, including a further survey of Paleolithic material (Taşkiran and Kartal 2004) and a survey of Classical-period caves (Barın, et al. 2003). The pattern of Bronze and Iron Age mounds in the Diyarbakır-Bismil (west) stretch of the Upper Tigris Basin was established by the Üçtepe surveys carried out from 1986 to 1992 (Köroğlu 1998; Özfirat 2001). Off-site components were not a part of any of these survey programs, and within the Holocene, archaeological research in the Upper Tigris has only investigated sedentary communities. The one exception to this is an Ottoman period campsite excavated in the upper levels of Ziyaret Tepe (Matney, et al. 2007: 25-29).

The salvage survey investigated sites of all periods, but settlement patterns of late historic periods, especially the Medieval Islamic and Ottoman periods remain unclear because the survey's team did not include an expert on these late periods. In addition, ceramic chronologies for such late periods have not been systematically investigated or published in the Upper Tigris area. Relevant materials have been excavated at the nearby medieval city of Hasankeyf, but these materials have not been published.

As the HMTS area centers on the site of Hirbemerdon Tepe, it seems appropriate to briefly describe the settlement and summarize the research carried out there. Hirbemerdon is a mound positioned on an elevated rock outcrop on the southern, outside edge of a meander of the

Tigris, immediately downstream from the Tigris' confluence with the Batman Su. Excavation began here in 2003 and has recognized six main periods of occupation: Chalcolithic (fourth millennium BC), Late Early Bronze Age (late third millennium BC), Middle Bronze Age (first half of second millennium BC), Late Bronze Age (late second millennium BC), Iron Age (early first millennium BC), and Islamic period (12th-14th century AD). Topographically the site has been divided into a 4-hectare high mound, a 3.5-hectare outer town, and a 3-hectare lower town. In terms of architecture and settlement extent, the Middle Bronze Age occupation is the most significant (Laneri, et al. 2006; Laneri, et al. 2008), though the Iron Age occupation has also been intensively studied (Guarducci and Laneri 2010).

The HMTS was designed with two goals in mind: to place Hirbemerdon in its immediate regional context and to extend and complement the regional survey work previously carried out in the Upper Tigris Region. Previous surveys had left unanswered several questions necessary for elucidating the general settlement history of the area. These questions included the presence and nature of settlement beyond the boundaries of the alluvial terraces, the presence, nature, and diachronic distribution of sites too small or too topographically indistinct to be picked up by vehicular surveys, the presence, density, and distribution of off-site artifacts and archaeological features, and the nature of surviving evidence for non-sedentary lifestyles. What chronological and settlement-type biases were incurred by earlier surveys targeting mounds on the terraces adjacent to the Tigris? What might field scatters represent in terms of off-site activities and subsistence? How might these conclusions compare to those in more agriculturally marginal environments nearby in northeastern Syria? How might we go about empirically reconstructing both the agricultural and the pastoral aspects of the traditional economy? Did seasonal and pastoral portions of society modify the landscape in the past, and how might these landscape modifications be indicative of local landscapes organization and camping and herding patterns? Such questions lent themselves to a small survey zone in which we could accomplish intensive

off-site coverage. It is the final two questions of course that form the focus of the previous and following chapters.

Use of Satellite Imagery and Pre-existing Maps

Satellite imagery and pre-existing maps played an important role in the collection methodology and the analyses of the HMTS. Three sets of satellite imagery were employed: IKONOS, Digital Globe, CORONA, Landsat and ASTER. One set of satellite topography data was also used: STRM.

IKONOS

A scene of IKONOS imagery (1 meter panchromatic resolution, 4 meter multispectral resolution) covering only the HMTS survey area (image date 23 May 2005, georeferenced to 10-m resolution SPOT imagery) provided the basis for tracing modern settlement extent, modern dirt road paths, and modern agricultural field boundaries before fieldwork commenced. Field boundaries and dirt tracks served as the geometries guiding the orientation and placement of pedestrian transects in the western portion of the survey area and allowed the team to classify surface visibility annually on the basis of crop coverage. Anomalies in the imagery were marked ahead of time as places of interest for further investigation, but the team quickly found that these anomalies were geological in nature. In particular, mottling in the image tended to be indicative of the presence of exposed patches of river cobbles. On the western terraces, satellite imagery was only successful in identifying the presence of stone constructions, including hunting blinds, graves, and some cairns, on hilltops. In the eastern uplands of the survey area, IKONOS proved to be of greater broad use in locating sites ahead of time. The stone alignments of tent platforms, corrals, house foundations, dams, and cairn fields preserved in the unfarmed areas were readily visible in the imagery and allowed the team to produce rough maps of sites which could then be ground-truthed in the field.

Digital Globe

Digital Globe imagery of 60 centimeter resolution, available online via Google Earth, was used alongside IKONOS imagery to examine and map sites in the eastern uplands before fieldwork began. Google Earth extended high-resolution imagery coverage in 2009 to include portions of the area south and east of the survey area, allowing the team to map campsites and abandoned villages beyond the boundaries of the survey area.

The area to the east of the HMTS area was systematically examined on the Digital Globe imagery. The 440 square kilometer area extended from the Batman-Tigris River confluence to the Batman-Mardin road, essentially the area from Hirbemerdon Tepe in the west to Hasankeyf in the east, south to the northern edge of the Gerçüş plain, and north to the edges of the narrow valley on the left bank of the Tigris River. These boundaries are arbitrary, but encompass most of the area that, like the HMTS' eastern half, consists of eroded limestone hills that today contain open pasturelands. Like the HMTS, the ground surface in this area was highly visible due to generally sparse vegetation and a lack of intensive agricultural land use. The goals of examining this area via satellite imagery were to determine if the land could have been open pastureland in the past, to determine what types sites and features could be examined remotely, and to determine if the patterns observed in the HMTS area were valid for the broader region. The Bismil-Batman survey provided regional context for sites recovered in the western half of the HMTS; the satellite imagery analysis provided a similar regional context for the eastern half of the HMTS.

The methods for identifying sites in the satellite imagery consisted of systematic visual inspection at an eye altitude of approximately 1500 meters. This altitude was sufficiently close enough recognize the traces of stone and earthen foundations, but not so close that local landscape context was lost. The recognition of various types of visible sites, including villages, campsites, dams, and abandoned field systems, was informed by the satellite imagery signatures of known, mapped sites in the HMTS. The specific signatures of certain types sites are discussed further in Chapter 6.

CORONA

Historic CORONA imagery shows the landscape as it appeared in the late 1960s and early 1970s, largely before the widespread introduction of modernized agriculture in the Upper Tigris. As such, the imagery was of use to the HMTS in suggesting the possible extent of non-mechanized agriculture and showing archaeological site preservation before the introduction of pump irrigation and mechanized agriculture. The extent of agricultural fields in the CORONA imagery is almost identical to the modern extent of these fields. This suggests that pastoral nomadic campsites and extensive pasture areas were already limited to in the eastern uplands 40 years ago.

CORONA satellite photographs have been of immense value in mapping ancient settlements, roads, and canals in northern Syria (Casana and Wilkinson 2005; Ur 2010; Wilkinson, et al. 2004), but were of much more limited use to the HMTS. Identification of sites via anomalies in the imagery was much more difficult. Just as for IKONOS, discoloration and crop marks on the imagery that would have been indicative of settlement in the Upper Khabur Basin or Amuq Valley tended to be geological in nature within the HMTS. Landscape-scale features such as hollow ways and traces of former canals were not visible, perhaps indicating a settlement history that was much less intensive or much more flexible than that of regions in northern Syria.²¹ Following georectification to 10-meter SPOT imagery, the resolution of CORONA scenes was approximately 2 meters, high enough to indicate the presence of surface architecture within villages, but not high enough to identify potential campsites.

Landsat, ASTER, and SRTM

Several lower resolution satellite imagery datasets were also employed for the purposes of placing the survey area in its regional context. Multispectral ASTER and Landsat imagery (15 and 30 meter resolution, respectively) were used in the analyses of vegetation and moisture that

²¹ Traces of irrigation features may, however, be visible in CORONA from the area around Ziyaret Tepe, ca. 20 kilometers west of Hirbemerdon.

allowed the identification of ideal pasture areas in Chapter 7. Data from the Shuttle Radar Topography Mission (SRTM, 90 meters resolution raster data, contours generated from 30 meters resolution data) allowed the accurate mapping of regional and local relief features and drainages. Slope, aspect, and distance to watercourses in particular are critical to consider in terms of site placement and the feasibility of various survey methodologies. The SRTM digital elevation model also served as the basis for regional least-cost path analyses.

Other Maps

In mapping topography, drainages, modern settlement, and modern land-use, the HMTS team was also aided by 1:25,000-scale maps provided by the Diyarbakır and Mardin Museums. Two map series produced in 1972 and 1984 by the Turkish government were available.

Surface Conditions Resulting from Modern Land Use

Modern settlement and land-use affect surface visibility across the HMTS area (Figure 5.3). Villages cover the summits and lower towns of mounded tell sites, crops hide field scatters, and freshly plowed fields obscure sherds within dirt clods. Mechanized plowing dredges up subsurface strata and shifts artifacts horizontally. Preparation of fields for irrigation often requires altering surface slope and thus the removal or addition of sediment to fields. Particularly in the case of a survey such as this one, which relies upon relative artifact densities in order to empirically define sites, it is crucial to consider the effects of surface conditions and modern land-use on artifact recovery.

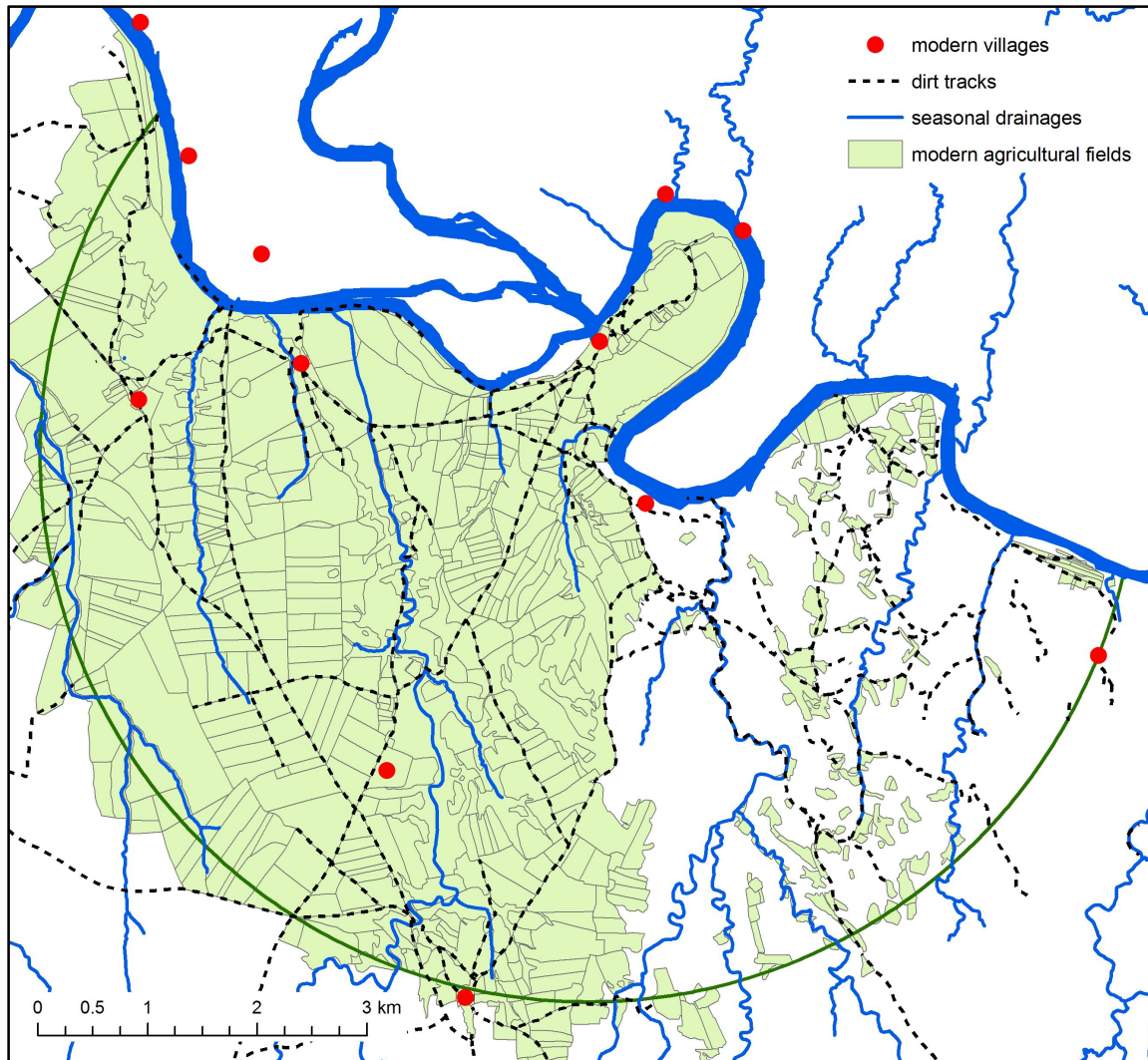


Figure 5.3: Features affecting surface conditions across the HMTS area, including agricultural fields, modern dirt tracks, modern settlement, and natural drainage systems.

West

Collection on the western river terraces recognized three main classes of land-use and eight classes of surface condition during the summer months (June-August).

- **Settlement**

- *Disturbed modern settlement surface.* Modern villages are frequently located on top of archaeological site of various periods. The surface conditions in these villages are highly variable. At one end of the spectrum, some areas have been

dug up for gardens or foundations, resulting in the exposure of artifacts. On the other hand, some areas have been packed, flattened, and cleared of all debris, both ancient and modern, for the purposes of a clean living surface. Artifact distributions in these villages are thus unreliable—artifacts may not be spatially representative their points of deposition—and surface collections are best made in an areal fashion.

- **Agricultural Fields.** With few exceptions, the HMTS team targeted only the most visible surfaces (harvested fields and fallow/burned fields) in a given year. As crops rotate and the HMTS season schedule shifted slightly year to year, most surfaces were available for survey at some point during the four field seasons. Artifacts are subject to horizontal movement in all plowed agricultural fields. However, controlled experiments have shown that the effects of plowing on artifact distribution are limited to moderate diffusion. In general the extent and location of surface assemblages remain relatively unaltered by plowing (Ammerman 1985; Rick 1976).
 - *Irrigated fields under crop.* This class includes cotton fields, watermelon fields, and vegetable garden plots. Due to the high value of cotton and vegetables for local farmers, plant height, and the highly disturbed nature of the irrigated surfaces, the HMTS avoided fields under these crops. An exception was made for the field below Hirbemerdon itself, which contained the so-called “lower town” and was consistently under irrigation every summer. This field was surveyed while under an irrigated watermelon crop.
 - *Dry fields under crop.* Dry farming in the Upper Tigris River Basin is restricted to cereals, mainly wheat. As the ground surface is almost completely obscured by a mature grain crop, fields under cereals were never surveyed before the harvest in early-mid June.

- *Harvested fields (stubble and chaff).* After harvest, the ground surfaces of grain fields remain covered by stubble (rooted plant bases) and chaff (loose vegetal material left by the harvesting machines). As in many parts of the Middle East, this stubble and chaff are left for grazing by village herds of sheep and goat. Prior to grazing most of the field surface is obscured, but 20-30 cm wide “aisles” of clear earth may exist between the rows of stubble. With a garden rake, it is possible to extend this “window to the surface” to a width of 50 centimeters. Raking the field surface is a labor-intensive task, however, so coverage of harvest fields was limited to two fields along the river that were annually under cereals. Coverage of these fields was deemed necessary for understanding the spatial extent of two already-identified sites.
- *Recently plowed fields.* Plowed fields are deceptive in terms of surface visibility. Lacking vegetation and crops, they seem to be areas of high surface visibility. However, their uneven surface hinders artifact collection in several ways. Surface artifacts may be hidden within dirt clods. These clods create a shadowed surface, making it difficult for fieldwalkers to spot exposed sherds. Recently plowed surfaces were left for coverage during a fallow year.
- *Fallow/burned fields.* Only some harvested fields are left for grazing by livestock. The rest are burned following the harvest and left fallow for at least one year. After the carbonized chaff has blown away, the condition of these fields is ideal for surface collection because it is even and free of vegetation. Every effort was made to target fields during their fallow year(s).
- **Agriculturally Peripheral Areas.** Modern agricultural fields or settlement cover the vast majority of the western survey area. Areas with wild vegetation are mostly limited to the slopes of seasonal drainages. Natural processes such as erosion may have displaced surface artifacts on these slopes.

- *Wadi bottoms.* Wadi bottoms are highly disturbed environments, and thus the HMTS team did not collect material from them.
- *Wadi slopes, tell slopes, and pasture.* The steep slopes of the seasonal drainages, the slopes of four mounded sites, and the typically uneven areas beyond agricultural fields are covered with wild grasses and weeds whose density depends on the strength of the previous winter's rains. In wet years (such as 2007 and 2009), this wild growth may be so dense and matted that the ground surface is not visible. In years of drought (such as 2008), dry conditions result in highly visible surfaces with minimal vegetation.

East

Collection in the eastern uplands recognized five of the above classes of surface condition: dry fields under crop, harvested fields, recently plowed fields, wadi bottoms, and wadi slopes/pasture. The eastern uplands were devoid of modern settlement, tells, and irrigation agriculture. Harvested fields were not burned, and therefore fallow fields took on the surface conditions described above for wadi slopes/pasture. Unlike the western agricultural terraces, surfaces were dominated by wild vegetation of variable density. Erosion displaces artifacts deposited on the steep slopes throughout the eastern uplands, so only artifacts recovered on the relatively flat surfaces of wadi terraces and plateaus between wadis were considered to be potentially spatially significant.

Collection Strategy

The methodology was guided by earlier considerations of the different landscape signatures of nomads by Cribb (1991b) and Wilkinson (2003: 172-174).

Overall Coverage and Intensity

The HMTS overall used a moderately intensive, systematic, stratified approach to cover the survey area (Figure 5.4). Salvage surveys already recovered the broader pattern of mounded sites, so the primary goal of the HMTS was to collect topographically indistinguishable sites, particularly those sites that might represent loci of pastoral nomadic activity. The orientation of overall coverage was dictated by the course of the six south-north seasonal drainages. Though these drainages lack surface water flow for most of the year, their sharp relief divides the landscape and makes collection impossible in some areas.

Initial full-coverage of the survey area involved following courses of the seasonal drainages and visiting areas of interest previously identified via satellite imagery and topographic maps within these drainages and on their interspersed plateaus. The sites that were identified in this manner were small tells, cemeteries, hilltop hunting blinds, cairn fields, campsites with standing architecture, and an abandoned village dating to the 1990s. All sites and area investigated were marked with handheld GPS units.

The geomorphology work previously discussed in Chapter 3 guided survey coverage near the river. The HMTS did not investigate the most recent alluvial terrace, T5, because this terrace is frequently subject to flooding and its surface is therefore highly disturbed. T4, the other river terrace that has formed since the initiation of sedentary human settlement in the Neolithic, would be expected to have a lower density of pre-Bronze Age surface artifacts because of alluviation. Thus, natural and anthropogenic cuts in this terrace were carefully inspected for evidence of artifacts and living floors. Two to four-meter-deep gullies on the edge of T4 resulting from irrigation run-off proved to be particularly useful for this purpose, as they revealed stratified

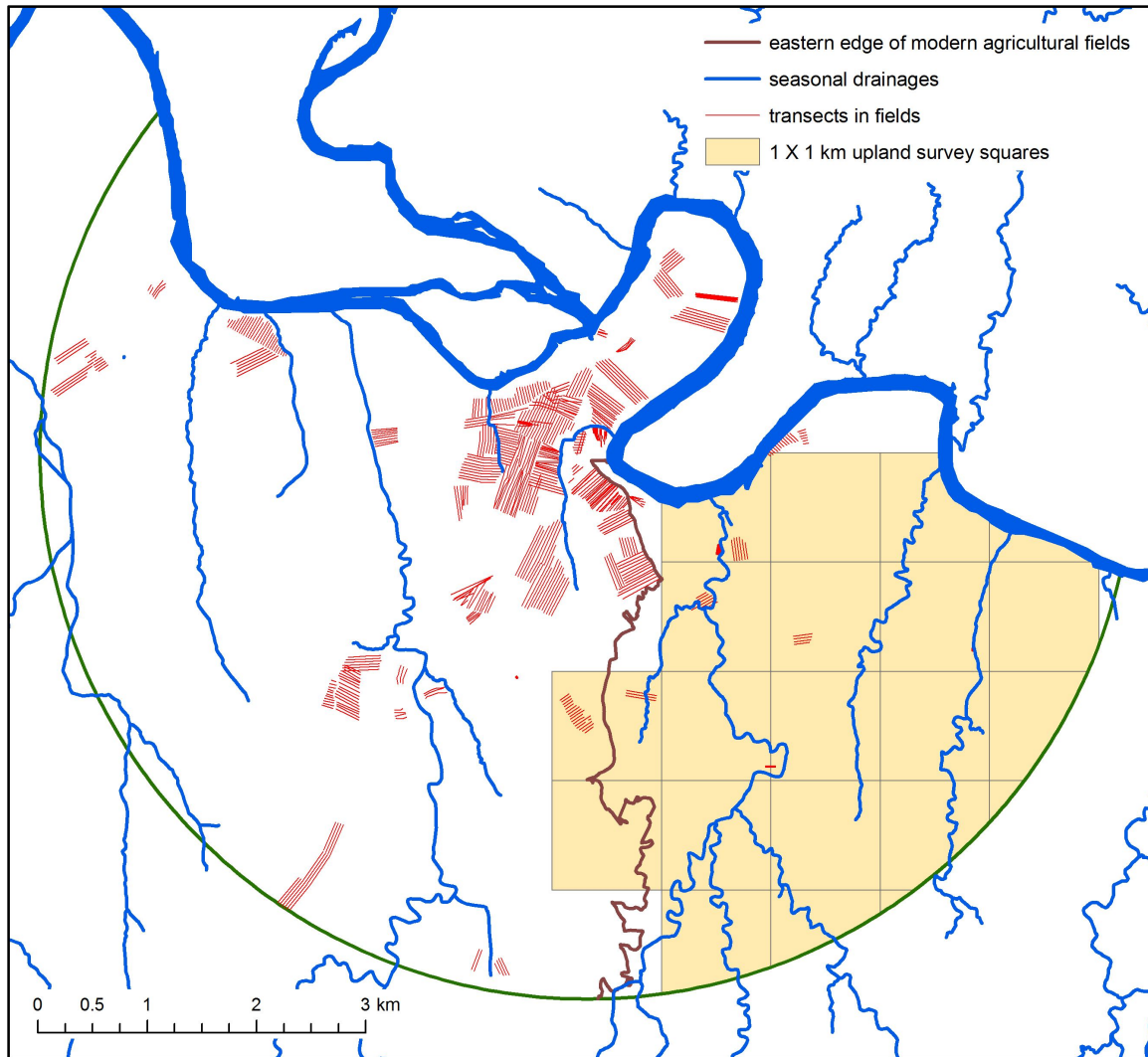


Figure 5.4: Locations of various forms of survey coverage, including paths walked along seasonal drainages, transects walked in agricultural fields, and survey squares examined via transects in the eastern upland area.

living deposits more than a meter and a half below the present field surface. Elsewhere—on the higher terraces and the plain above the river valley—alluviation should not be a factor affecting preservation and site visibility.

Observations from this initial coverage indicated a fundamental division in site morphology and preservation between the western and eastern portions of the survey area. Two suites of methodologies were applied to investigate specific questions separately in the west and

east. These methodologies were designed to cope with the different topography, land-cover, and degree of archaeological preservation in the two halves of the survey universe.

Assessing these methodologies, requires discussing different levels of coverage intensity. Intensity of coverage is typically defined by the number of man-hours a project spends per unit of terrain. In the HMTS, intensity was altered on the basis of topography and land-coverage by changing the spacing of pedestrian transects.

West

On the western terraces, three morphological classes of sites observed in the preliminary coverage required further investigation: tells, ridgetop sites, and field scatters. The HMTS conducted areal collections on tells and ridgetop sites for the purposes of dating and defining settlement extent. Opportunistic observations during the preliminary survey coverage indicated the presence of ceramic and lithic scatters within agricultural fields. Without systematic recording of these scatters, it was impossible to discern if these represented inhabitation sites disturbed by plowing or constituted evidence for intensive agriculture and manuring, as seen in northern Syria and Iraq (Wilkinson 1982; 1989). Transect collections were undertaken for the purposes of characterizing these assemblages and investigating the relationship between background noise and site-level artifact density.

Previous surveys had already mapped the two topographically distinct tell sites on the western terraces. During preliminary coverage of area, the HMTS identified three additional tells that are located above the alluvial terraces and were thus outside of the salvage zone covered. Chronologically diagnostic artifacts were recovered from all mound surfaces in areal units defined by topography. Areal collection of diagnostics was extended into the fields surrounding the mounds in order to determine the presence and extent of “lower towns.” These areal collections were analyzed separately in order to determine if chronological patterns of settlement growth and contraction could be recognized.

Ridgetop sites included cemeteries of various types, hunting blinds, and cairn fields. As ridgetops were not typically under agricultural fields, the stone features of these sites have remained intact and have a clear signature on satellite imagery. After sketching and photographing these sites, the survey team made areal collections of diagnostic sherds and lithics. The boundaries of these collection units were delimited by the extent of the stone features and topography.

Topographically indistinct sites and field scatters of artifacts were documented with a siteless, transect-based methodology. With this methodology, the HMTS' basic units of data shifted from the level of the site to the level of the artifact and the approach changed from full-coverage to systematic sub-sampling. In agricultural areas where surface visibility is high, the team systematically walked ca. 100 meter-long transects at 25 meter spacing, mapped individual artifact positions, and only later defined sites empirically based on density interpolations. The layout and orientation of these transects followed the system of agricultural fields for two reasons. First, the fields provided a convenient, manageable method of division. Second, the state of these fields in the agricultural rotation (plowed, under crop, harvested, burned, fallow) determined their individual surface visibility for that year.

The HMTS' transect methodology relied on a Trimble GeoXT handheld computer with built-in GPS running ESRI's ArcPad mobile GIS software. Utilizing the field boundaries traced from the IKONOS image, transects within fallow fields were planned in the software the night before fieldwork. The survey team member operating the Trimble placed white nylon flags at the beginning and end of transects, with intermediate guide flags. Using these flags as a bearing, other survey team members walked the transects, collecting all sherds and lithics and placing different colored nylon flags (red for ceramic, blue for chipped stone) in the location of these artifacts. Fieldwalkers were instructed to limit their coverage to a two-meter wide swath, one meter on each side of the transect. The Trimble Geo XT operator swept behind the fieldwalkers, mapping individual artifact positions and collecting the flags. Thus, while individual artifacts

were the unit of the spatial data, the unit of material data was the aggregate assemblage of a 2 X 100 meter area (8% of the field area) covered by a single transect.

It was assumed that field scatters would represent various types of ephemeral rural land-use, including activities related to pastoral nomadism. Ethnoarchaeological data indicate that dwelling spacing in pastoral nomadic campsites in the Taurus and Zagros mountains tended to be anywhere from 20-100 m (Skogseid 1993: 229; Tapper 2002b: 271). While 25-meter transect spacing was excessively intensive for the purposes of documenting large dense field scatters such as that in the lower town at Hirbemerdon, the decision to undertake collection at such a survey intensity was motivated by a desire to resolve features at the lower end of the size and settlement intensity spectrum. In addition the team found in practice that 25-meters was the widest spacing that allowed the Trimble operator, who had to range over the transects of 3-4 fieldwalkers in order to map and collect flags, to keep up with the rest of the team under moderate ceramic density.

The pattern of transect coverage is less scientifically justifiable. Ideally the HMTS would have systematically covered randomly selected sample zones with the transect-based sub-sample methodology. However, this was not feasible due to topography and surface visibility. Coverage with this intensive methodology had to follow the pattern of highly visible surfaces, i.e. the fields that were left fallow sometime during the three field seasons. Of the available fields, the HMTS attempted to select areas in all geomorphological zones. Some coverage was achieved on the four inhabitable alluvial terraces, and swaths of fields were covered away from the river on the higher plain. The western half of the survey region covers 30.5 square kilometers, 3.48 of which (11.4%) were covered with tightly-spaced transects over the course of four seasons.

Analyses of field scatter density treated ceramics and lithics separately and employed kernel density estimation (KDE). KDE is part of a larger class of neighborhood functions or local interpolations where the values for a particular area (represented by a raster cell) are estimated using the values surrounding that area (each cell). KDE functions provide a non-parametric

means to produce a continuous surface showing the changing density of an attribute over space, in this case the changing density of ceramic and lithic artifacts over field surfaces (Conolly and Lake 2006: 175-178). To implement KDE, four inputs are required: the spatial distribution of the measured attribute, a population or “weight” field indicating how many times each attribute should be counted, the kernel or search radius indicating the size of the neighborhood that will be used to estimate the density at a particular point, and the size of the output raster cells. For the Hirbemerdon Tepe data, these inputs were the distribution of ceramic and lithic artifacts, the database field indicating how many ceramic or lithic artifacts were observed at that point (typically one, but sometimes more in areas of very dense scatters), a search radius of 30 meters, and a cell size of 10 meters. Mathematically, the KDE method fits a smooth, curved surface over each attribute point. The value of this surface is highest at the location of the point and decreases with distance from the point, reaching zero at the search radius distance from the point. The volume under the surface equals the population/weight field value for the point. The density for an output raster cell is calculated by adding the values of all the kernel surfaces where they overlay the raster cell center. Changing the search radius does not significantly change the calculated density, as a larger or smaller number of attribute points will be divided by a larger or smaller area to determine the density.

A KDE search radius of 30 meters was chosen on the basis of survey methodology. During most fieldwalking, the HMTS team walked transects at 25 meter spacing and constrained their collections to a distance of 2 meters on either side of the transect. Thus, while observations along the length of the transect were continuous, there was a 21 meter gap in observations between two transects and observations associated with two different transects could be up to 29 meters apart. The 30 meter search radius ensured that points from 2-3 transects were factored into the density calculations for each point.

Before applying KDE to the artifact distributions, these distributions were streamlined to improve the accuracy of the result. Any artifact points mistakenly taken more than 2 meters from

the transect line were not considered. In the first two survey seasons, as the team was developing its methodologies, team members sometimes walked transects spaced closer than 25 meters. In these areas, the data were “thinned” so that only transects around 25 meters from each other were used in the KDE. These modifications to the raw dataset were necessary to ensure comparability among the density estimations for each field. Because coverage of the fields was not continuous, more closely spaced transects or transects whose observations spread beyond the 2 meter window would raise the KDE value in those areas, perhaps creating an artificial spike in the resulting raster surface.

“Site level” concentrations within the artifact scatter were identified and defined using the clusters shown by the KDE interpolation (Figure 5.5). Any threshold will necessarily be arbitrary, and a change in threshold will change the number of clusters and their size. The HMTS set its site concentration threshold at two standard deviations above the mean, about 5.5 artifacts

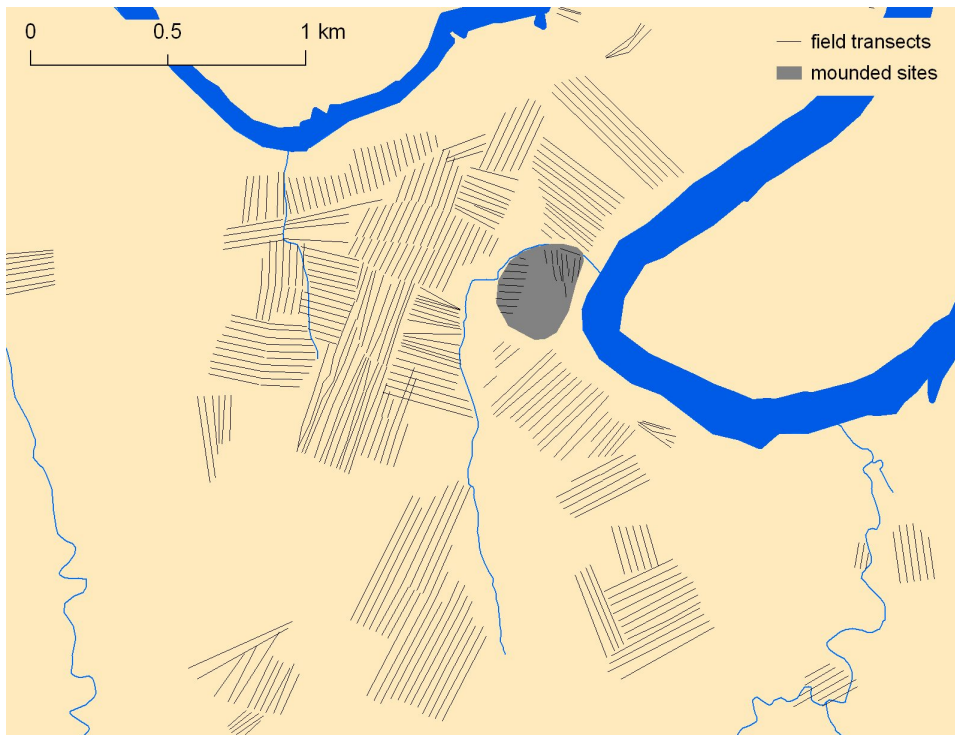


Figure 5.5: Series of images showing the use of kernel density estimation to define archaeological sites from field scatters of ceramic sherds. Areas identified as sites are shown in red in the final image. (Continued on next page)

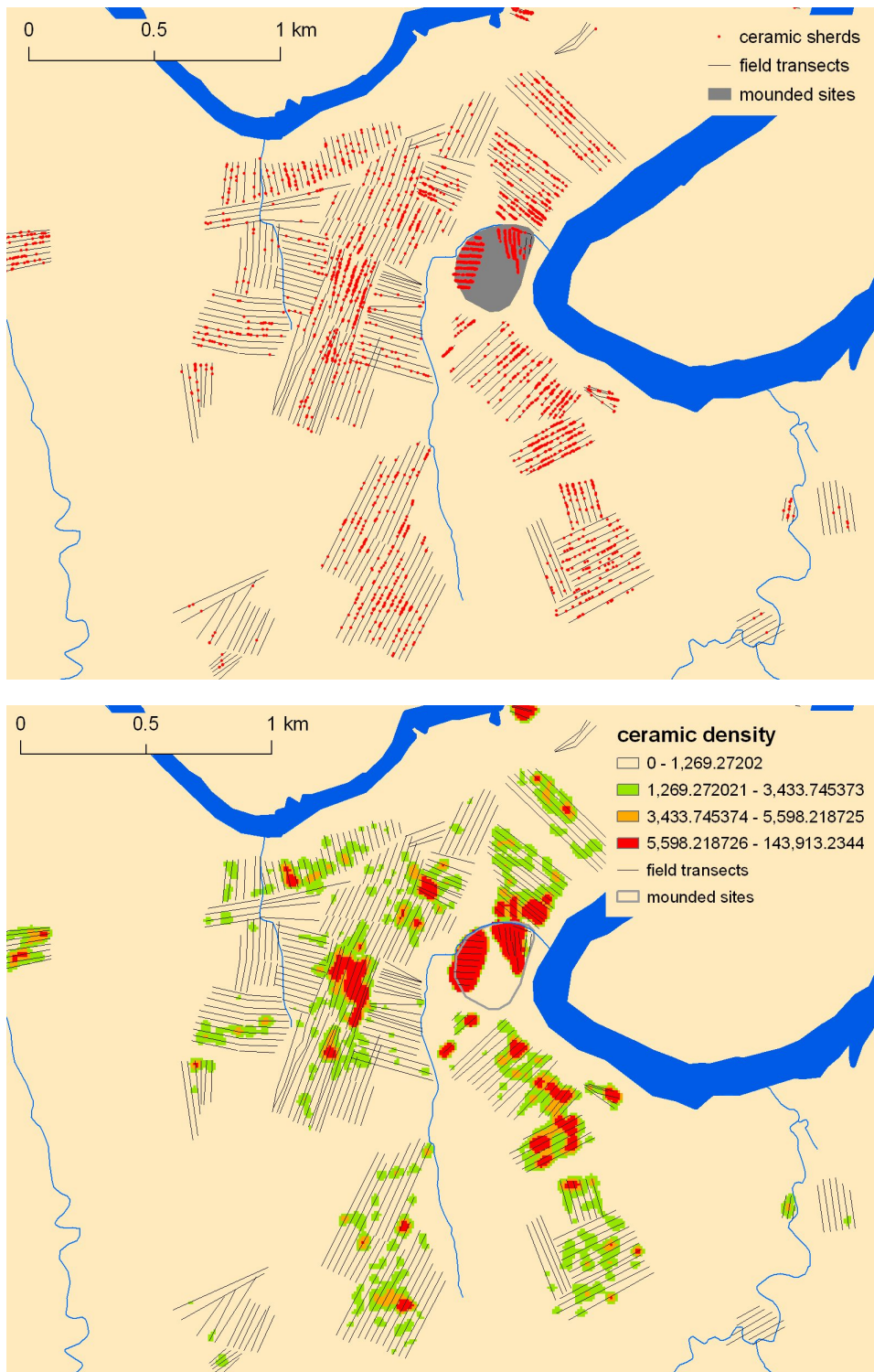


Figure 5.5 (continued): Series of images showing the use of kernel density estimation to define archaeological sites from field scatters of ceramic sherds. Areas identified as sites are shown in red in the final image.

per square meter. Any area with a density above this constituted a site; background scatter characterized areas with lower densities.

East

Preliminary coverage in the eastern uplands revealed campsites with standing architecture, cairns, hunting blinds, and check dams. The stone constructions of tent foundations and animal corrals as well as stone piles comprising cairns, hunting blinds, and dams were highly visible in IKONOS and Digital Globe imagery. During preliminary coverage the survey team had located a rock-cut cistern, the flat stone alignments of a dismantled campsite, and several caves that had been used as animal pens, none of which had been visible from the satellite imagery. With the goal of locating landscape features relevant to herding, the HMTS carried out a full-coverage survey of the 16.5 square kilometers.

Observations during the period of preliminary coverage suggested the density of artifact scatter in the eastern uplands was considerably lower than that of the western terraces/plain. This observation makes sense based on recent land-use in this region. Pastoral nomadic sites are known to have a much lower density of artifact scatter compared to sedentary sites (Cribb 1991b; Wilkinson 2003: 56). Chapter 4 suggests that the eastern uplands may have been used for herding over the last 500 years. Thus, the overall artifact density should be lower in this area. The lower scatter density, the preservation of architectural features, and the higher visibility resulting from vegetation and uneven topography in the eastern uplands suggested that sites would be difficult to define on the basis of ceramic scatter and a less intensive methodology with greater transect spacing would achieve results similar to the 25-meter interval methodology implemented on the western terraces. Before deciding upon a less intensive methodology in the eastern uplands, the HMTS team conducted experiments to show empirically that the density of artifact scatter is much lower in the upland area and to characterize the density of background noise (Figure 5.6).

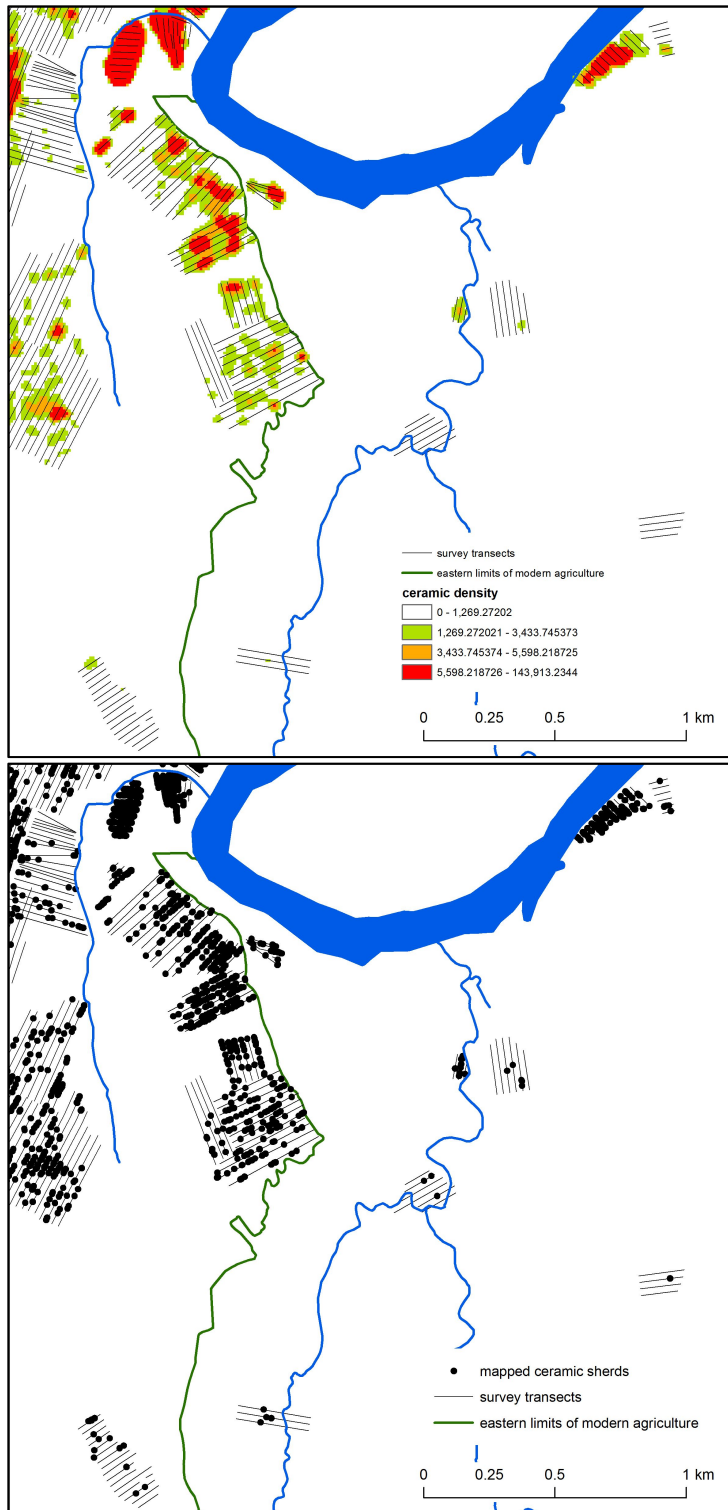


Figure 5.6: Spatial distribution of ceramic sherds along the experimental transects surveyed in the eastern upland portion of the survey area and map of sherd densities showing that the density of sherds in the eastern uplands is considerably lower than that of the western river plain.

The area was divided into one by one kilometer blocks and surveyed in a roughly cardinal orientation either north-south or east-west with 70-100 meter transect spacing. Topography determined the exact orientation and spacing of transects, with one surveyor located in wadi bottoms, one surveyor mid-slope, and one surveyor on ridge tops (Figure 5.7a and 5.7b). Utilizing the terrain relief in this way and keeping fieldwalkers within sight of one another allowed the team to achieve a full-coverage visual inspection. Surveyors did not strictly remain on their transects but instead ranged around and used topographic high points to increase their visual coverage. Each fieldwalker carried a GPS unit in order to record features of interest. The tracking feature on the GPS units was left running during the workday so that the director could check the actual coverage in the evenings and insure that any “holes” in coverage were re-visited.

Features of interest recorded by individual fieldwalkers were later re-visited by the entire survey team. During this second visit, the features were mapped and described and areal collections were made of diagnostic pottery and lithics. As several of the features were either modern or archaeological features current still in use, the presence or absence of modern debris (plastic, trash, etc.) was noted. Sherds in the eastern upland area were collected only for dating purposes and not for site definition. Thus, the eastern area was covered with site-based methodologies. Nonetheless, the methodologies remained off-site in the sense that the overall emphasis in both the western and eastern areas was on the whole landscape.

The density of wild vegetation affected the visibility of the more ephemeral sites. The summer of 2008 marked a severe drought year for local farmers, many of whom did not invest the effort to harvest their stunted grain crops. However, the sparseness of wild vegetation resulting from the lack of winter rains was a lucky occurrence for the survey team, as even faint stone alignments were visible on the bare surfaces of the eastern uplands, often from considerable distances. Most of the survey coverage in the east was accomplished during the 2008 season in

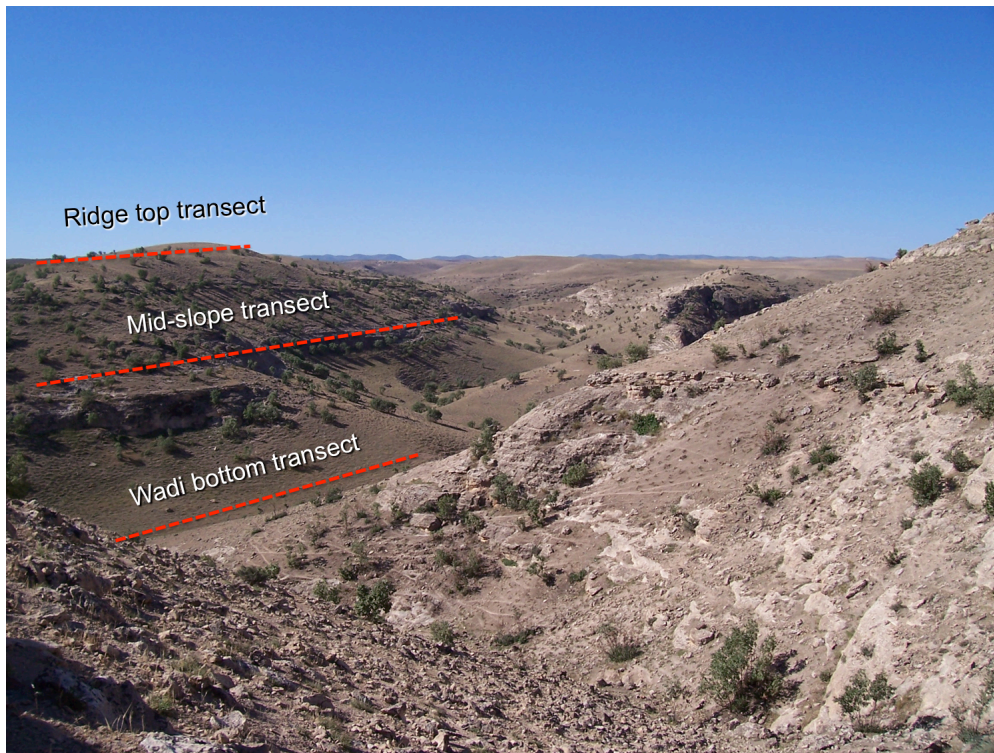


Figure 5.7a: Transects planned according to topography on the slopes of the eastern uplands.

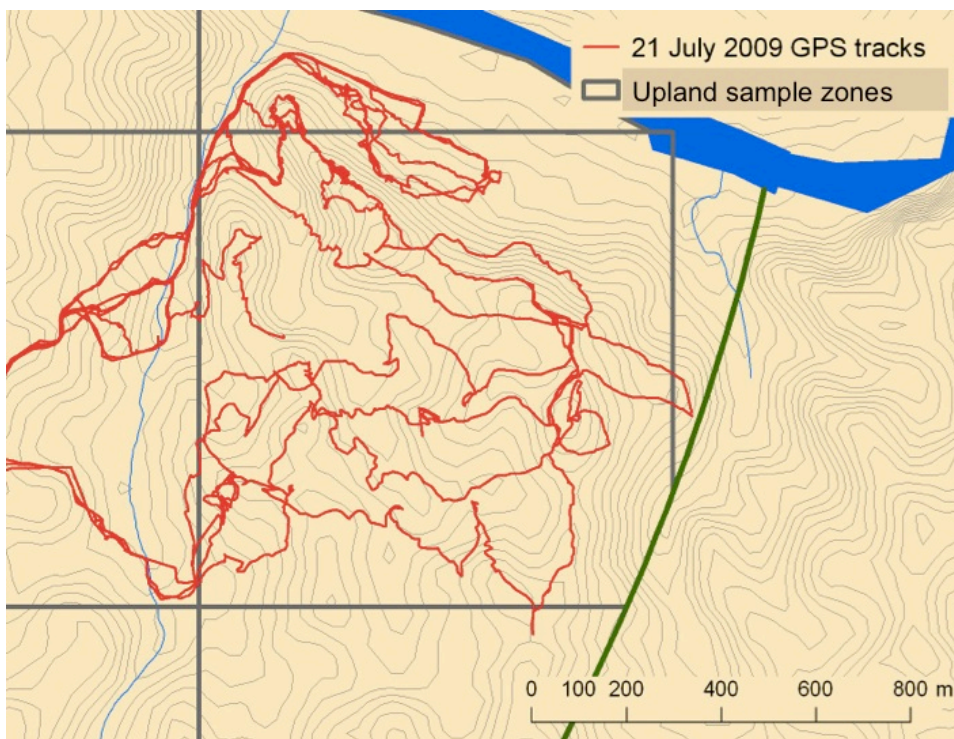


Figure 5.7b: Actual coverage of one of the upland survey squares according to topography. Paths generated using the tracking feature on the handheld GPS units used by the surveyors.

order to make use of the archaeologically ideal (though economically unfortunate) conditions. Upland features surveyed under the wetter, denser vegetation conditions in 2007 were revisited in 2008 and 2009 to confirm earlier assessments under different ground conditions.

Material Processing Methodology

Ceramics

Only diagnostic sherds were collected from areal units on tells and areal units/transects on campsite surfaces. These sherds were used only for dating purposes and thus were drawn for comparison to published chronologies.

Interpretation of field scatters depends on their location, ceramic ware characteristics, and the spatial distribution and density of artifacts. All sherds were retained from transects mapping artifact scatters within agricultural fields. Only a small fraction of these sherds were chronologically diagnostic, but the entire assemblage was collected and broken down into eleven rough fabric classes based on color, temper, and firing (including coarse and handmade with reduced core; sand-tempered reddish, chaff-tempered red, buff surface with pink core, buff to green with wheel striations, greyware). Each of these classes encompasses a fair amount of variation, and some classes tend to overlap one another. For example, a fair number of reddish sherds were tempered with both chaff and sand, and assignment to a single fabric category required deciding which material formed a greater fraction of the temper. Subsequent to classification, each group was counted, weighed, and examined for unusual characteristics. Diagnostics were then separated for drawing.

The goal in establishing these fabric classes was to extract potentially significant chronological information from otherwise undiagnostic sherds. As color, temper, and firing are indicative of aspects of ceramic production technology, fabric classes may be used to isolate assemblages likely to belong to certain chronological periods or conversely to eliminate the possibility that otherwise undiagnostic ceramics from other periods were present. In northeastern

Syria, such fabric classes have been used to distinguish between assemblages of the fourth and third millennium BC inhabitations at Tell Hamoukar (Ur 2010). Within the HMTS, fabric classes were most useful for identifying sherds likely to belong to the Neolithic and Islamic periods.

The survey team recorded counts, weights, and descriptions of sherd characteristics (sharp breaks versus abraded edges) for the purposes attempting to characterize past land-use. Again, surveys in Syria served as a methodological model. It has been argued that assemblages of small, highly abraded sherds are representative of past manuring practices, and are thus indicative of agriculture intensification (Ur 2010; Wilkinson 1982; 1988; 1989; 2004b).

Dating of diagnostic ceramics was based on ceramic typologies established by ongoing excavations in the area (e.g., Kozbe, et al. 2004; Laneri, et al. 2006; Laneri, et al. 2008; Matney, et al. 2003; Matney and Rainville 2005; Matney, et al. 2007; Matney, et al. 2002; Ökse and Görmus 2006; Parker and Dodd 2003). For the limited number of types existing in northern Mesopotamia, previous survey ceramic chronologies from that region were employed (Ur 2010; Wilkinson and Tucker 1995). Useful ceramic chronologies for the medieval Islamic and Ottoman periods were unfortunately not available.

Other

Chipped stone tools, flint cores, and diagnostic knapping debris were retained from transects mapping artifact scatters within agricultural fields. Specialists are currently undertaking analyses of these lithic materials, and these materials are not included in the present study. The presence of other materials, including modern materials such as glass, metal, plastic, etc. was noted during transects on campsite surfaces, but these materials were not collected.

General Results

Figure 5.8 shows a map of all 136 recovered sites. 685 transects totaling 110995 meters in length resulted in the collection of over 9200 sherds and 3875 lithics. In the west, five

mounded sites were identified via topography and collected in areal units, sixteen ridgetop sites were identified with the aid of satellite imagery, and 14 field scatters of site-level density were defined on the basis of transects with 25 meter spacing and kernel density interpolation. In the east, 18 campsites, 11 isolated animal corrals, 29 cisterns, 118 individual dam features, 1533 cairns, 181 caves, and 87 hunting blinds were mapped during both preliminary coverage and systematic transects with 70-100 meter spacing. Mounded sites are limited to the western half of the survey universe, whereas campsites with preserved surface architecture with only one exception are limited to the eastern half of the survey universe. The majority of sites yielding diagnostic pottery for dating are located in the west, meaning that alternative dating methods will have to be devised for sites in the east.

The distribution of sites with respect to the river terraces largely confirms the observations and conclusions already drawn by geomorphologists (Doğan 2005; Kuzucuoğlu 2002). All of the Bronze and Iron Age mounds, including Kavuşak, Hirbemerdon, Güzelköy, and site 97, are located on the T2 terrace or higher. On the T4 terrace there are only three sites. One, as Doğan and Kuzucuoğlu predict, is of the Late Chalcolithic period. This site is covered with approximately 1.5 meters of alluvial deposit and soil built up from irrigation run-off. The other two are the Bronze Age lower town of Hirbemerdon itself, located on a terrace below the mounded site to the north, and the Medieval Islamic lower town of Kavuşak Höyük, located on a terrace to the northeast of the mounded site. Hirbemerdon does not conform to what has been previously written by the geomorphologists, who concluded that the river terraces were not inhabited in the Bronze Age, likely due to floods. In this instance, survey methodology is to blame; the archaeological data upon which the geomorphologists relied only included topographically distinct sites—höyüks, that is—which were discovered on the basis of extensive, low intensity surveys. The position of Hirbemerdon's lower town demonstrates that settlement was possible and did take place at certain points during the Bronze Age on this partially formed

lower terrace, however the settlement was buried by alluviation and flattened by tilling, thus requiring intensive off-site survey methodologies for its discovery.

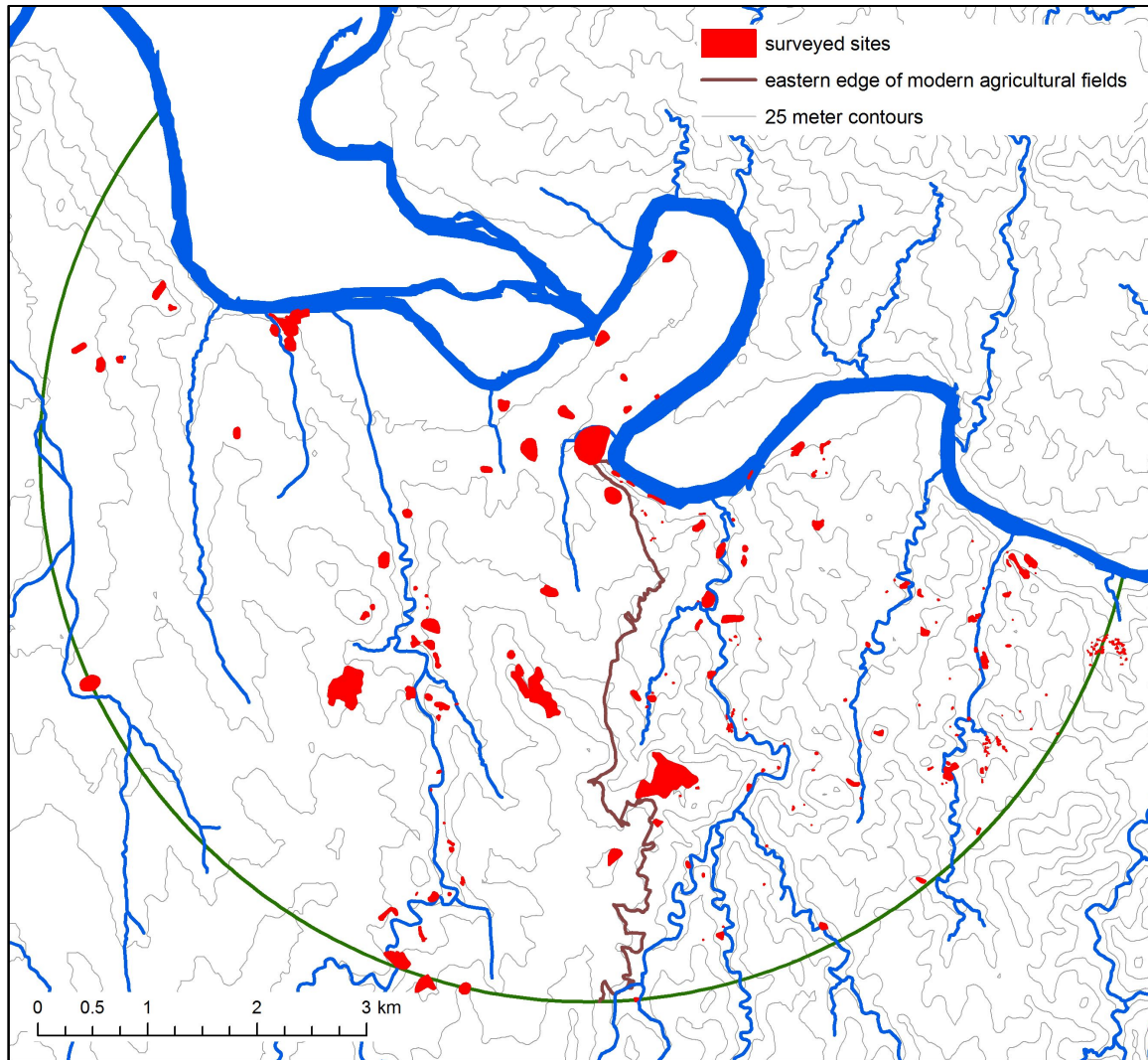


Figure 5.8: All 136 sites mapped during four seasons of fieldwork by the HMTS.

Integration of Archaeological and Ethnographic Data

The integration of ethnographic data from both historical sources and twentieth century ethnographies into analysis of survey data are important in examining local landscapes of pastoral

nomads in the Upper Tigris River Valley. Thus, it is important to address the relationship between ethnography and archaeology and the role of ethnography in the present study.

Research frameworks that employs archaeological and ethnographic methods in order to expand archaeological interpretation have frequently been applied in the Near East (e.g., Aurenche, et al. 1997; Horne 1994; Kramer 1982; Watson 1979; Wendrich and Kooij 2002) and to studies of mobile peoples and pastoral nomads in particular (e.g., Aurenche 1984; Avni 1992; Banning and Köhler-Rollefson 1992; Chang 1992; 1993; Chang and Tourtellotte 1993; Cribb 1991a; b; Eldar, et al. 1992; Hole 1978; 1979; 1980; Rowe 2002; Saidel 2009; Saidel and van der Steen 2007; Zarins 1992). However, such approaches also have been criticized. Modern pastoral nomadism operates in a very different physical, economic, political, and social landscape than ancient pastoral nomadism would have (Khazanov 2009). In particular, modern pastoral nomads do not provide a valid analog for late prehistoric forms of animal management because seasonal long-distance migrations, tribal structures, and pastoral use of marginal landscapes are adaptations to specific natural and social contexts in the modern world that did not exist in the past (Gilbert 1975).

While it is always important to consider the limits of ethnographic analogy, ethnographically studied groups are still relevant to the archaeologically documented sites and features recovered by the HMTS. The sites and features resulting from pastoral nomadic land-use probably date to the last 500 years. The inhabitants of the documented campsites are temporally and characteristically much closer to twentieth century pastoral tribes than the hypothetical Neolithic and Bronze Age pastoralists discussed by many critics of ethnographic analogy applied to the study of pastoral nomads (Gilbert 1975; Khazanov 2009; Rosen 2008: 117). Further, the data presented in Chapter 4 show that long distance, tribal pastoralism has at least a 1000-year history in the study area and that pastoralists in the region have been pressured to use progressively marginal landscapes throughout at least the last 500 years.

One of the major themes to emerge from ethnographies is that the organization and practices of pastoral nomadic groups are contingent upon very specific ecological, economic, and historical circumstances. Thus, the modern data employed to enhance our archaeological interpretations of pastoral nomads in the Upper Tigris Region will lead to more valid conclusions if it comes from this same region. In general similar environment and location lend credibility to ethnographic analogy in archaeology (Ascher 1961; Gould 1980; Wylie 1985). In drawing on previous ethnographies, I restricted the sources to those concerning vertical pastoral nomadism in the Taurus and Zagros mountains in order to attempt to control for significant environmental and ecological differences in the archaeological and ethnographic datasets.

Ethnography in this study serves as means to an end, assisting in the conceptualization of the local landscape as a system rather than as an array of site locations (Chang 1992) and assisting in the generation of hypotheses that can be tested with archaeological data.

Ethnographic observations on the spatial organization of pastoral activities are used to understand how herdsman organize their landscape through the construction of pastoral facilities and the use of pasture tracts and other essential resources such as water. Previous ethnographic studies have not focused on local landscape organization. In general ethnoarchaeological studies focusing on a scale greater than the site are rare (David and Kramer 2001: 250). In order to further aid archaeological interpretation, it would be necessary to collect ethnographic data on modern activities and processes that occur at a spatiotemporal scale similar to those pre-modern activities and processes that produced the relevant archaeological data.

Justification of Methodology

Every survey design is fundamentally a compromise between research goals and what is feasible with the available time, manpower, and budget. For the purposes of further work towards the final publication of the HMTS and the purposes of readers wishing to employ the

HMTS' methodologies elsewhere, I will make a few comments regarding these methodologies and their coverage. This seems necessary especially in light of the rather complicated combination of methodologies employed.

Blanton's criticism of Mediterranean myopia—the intensive investigation of microregions at the expense of answering broad anthropological questions—does not apply to the HMTS. Blanton is correct in leveling this criticism at intensive surveys that investigate a few square kilometers without having any conception of the broader regional settlement pattern. However, the HMTS is an intensive survey designed to address remaining questions in an area where the general regional settlement patterns have already been established and there is no risk of the so-called “Teotihuacán effect” (Flannery 1976: 134). Previous mound surveys in the Upper Tigris Basin are critical in providing the regional context that makes an intensive, specialized survey such as the HMTS desirable. A major contribution of the HMTS is that it provides an idea of what these earlier extensive surveys were not capable of finding. The position of the HMTS on the edge of the original salvage survey zone, at the interface of two geomorphological zones, offers the possibility to compare the nature of settlement on the river terraces, plains above the river terraces, and the upland margins of the plain and to think about local patterns in terms of the wider regional context.

The survey coverage and definition of sites in the western and eastern halves of the survey universe may seem at first to be inconsistent, especially considering arguments regarding the value of intensive survey and empirical site definition in the context of the field scatter data collected in the western half of the survey area. Site definition in the eastern uplands proceeded more qualitatively, unlike the density threshold definition made possible by closely spaced transects and artifact density maps in the west. Boundaries were delimited according to surface architecture. Ideally all surveyed sites would have been defined quantitatively, but in reality this would require too much labor and too little return to be practical. The team only undertook empirical definition and siteless methodologies for sites that were both topographically

indistinguishable and lacking in insitu surface manifestations. Such sites are produced not only by the behavior of their occupants, who inhabited the area in a manner that was either too short or too dispersed to produce a mound high enough that it would remain undisturbed by agriculture, but also by the activity of later inhabitants who either re-used the original site's building materials or cleared and plowed the original site until it was invisible to the naked surveyor eye.

The HMTS team attempted to recover the same type of features in the western and eastern parts of the survey area, but topography and more importantly modern land-use dictated that different survey intensities were necessary to accomplish this task. Transect experiments in the eastern upland area suggest that the recovery between the two halves of the survey area is roughly comparable. The main difference in result, then, is the statistical sample. In the east, topography, ground visibility, and relatively good site preservation made it possible to detect small sites with 70-100 meter transect spacing, and thus possible for the team to achieve close to 100% coverage with the necessary methodology. Poor ground visibility and the destruction wrought on archaeological remains by farming in the west made it necessary to employ 25-meter transect spacing. As this spacing is up to four times more intensive, the team was only able to achieve 11.4% coverage in the allotted seasons.

The HMTS employed 17 fieldwalkers over four seasons, averaging around 4-5 members at any given time. In surveys employing large teams with high turnover, a legitimate concern is collector bias, that is, that some surveyors see more artifacts or identify more sites than others. The HMTS attempted to counteract collector bias by pairing new team members with an experienced member for training purposes. In both the east and west halves of the survey universe, sites defined on the basis of in situ surface features and topography were always re-visited by at least one of the three senior survey team members. In the case of the field scatters collected in transects and mapped using the Trimble GeoXT, it is possible to show mathematically that there was not a statistical difference between the *ceramic* collections made by different team members.

Several Mediterranean surveys have found (e.g., Cherry, et al. 1991) that collection of lithic material tends to be much more variable and less reliable than collection of ceramic material. While it takes very little training for fieldwalkers to recognize ceramic sherds, a higher level of knowledge and discretion is required for distinguishing between deliberately and accidentally modified chipped stone. This was a difficult issue for the HMTS, which is located in an area with considerable flint sources. Nodules in agricultural fields are often reduced to “tool-like” pieces when repeatedly struck by plows. Analysis of data collected via the closely-spaced transects in fields indicate that highly significant statistical difference between the lithic collections made by different team members.

Before final publication of the survey material, two critical issues should be resolved. One concerns the lack of chronological information for the campsites and landscape features in the eastern half of the survey area. Dating of landscape features is a ubiquitous issue in survey archaeology. Many of these sites lack chronologically diagnostic surface assemblages, and it will be necessary to turn to radiometric dating methods. Several possibilities to be investigated include terrestrial in-situ cosmogenic nuclide dating of cisterns, C-14 dating of material taken from campsite hearths via geological soil cores, and dating of cairns via measurements of lichen growth. The second issue concerns transect coverage of the western half of the survey area. Currently coverage is so sparse and unrepresentative that the results can only be used in an anecdotal fashion. This is not to downplay the importance and validity of these data, it is only to say that, if we are to be able to make statements about the diachronic distribution of unmounded sites with any sort of authority, it is necessary to achieve a larger and more varied sample of fields, particularly fields further away from the river.

Conclusion

Pastoral nomads are often assumed to be archaeologically invisible, but the agricultural marginality of the survey area and a relatively intensive set of methodologies permitted first the survival and second the recovery of pre-modern pastoral nomadic sites. The spatial and temporal patterns of both sedentary agricultural and nomadic pastoral settlement form the subject of the next chapter.

CHAPTER 6: ELEMENTS OF THE ARCHAEOLOGICAL LANDSCAPE SURROUNDING HIRBEMERDON TEPE

Introduction

The majority of archaeological research focuses on sites with stratified habitation layers, but these sites are only one of many archaeological elements in the landscape of southeastern Turkey. Such a focus has resulted in the systematic under-representation of less topographically visible sites and features. The Hirbemerdon Tepe Survey (HMTS) aimed to recover systematically all types of features evidencing past human activities within its 47 square kilometer area, including inhabitation sites such as tells, campsites, and caves, non-inhabitation sites such as cemeteries and cisterns, and landscape features such as cairns, terraces, check dams, and field scatters. Additional satellite imagery work aimed to systematically map visible sites, campsites, and landscape features in a larger area of approximately 440 square kilometers. The data resulting from four seasons of survey (2007-2009, 2011) and extensive examination of Digital Globe satellite imagery are described in this chapter and further analyzed in Chapter 7.

In presenting the survey data, the topographical and geographical division of the survey area established in the presentation of the environment (Chapter 3) and methodology (Chapter 5) is maintained. River terraces and the surrounding steppe-plain, both primarily used today for agriculture, characterize the western portion of the survey area. Eroded slopes of the more topographically uneven uplands with limited agricultural potential, used today for pasture and small-scale agriculture, characterize the eastern portion of the survey area. The division of results according to these two areas is necessary because different modern land-use patterns necessitated different survey methodologies in each and resulted in the survival and recovery of different types of sites. However, it is important to note that the division does not necessarily correspond to a clear separation in ancient land-use patterns. While there is a general trend towards fewer

archaeological features associated with long-term sedentary settlement and substantial agricultural land-use from west to east, the two halves of the survey area would have been more similar in agricultural potential and settlement character before the expansion of farming in the Ottoman period and the introduction of mechanized agriculture in the late twentieth century. Several types of features are uniformly found in both the western and the eastern portions of the survey area. Further, a number of archaeological features in the western portion of the survey area might be associated with pastoral nomadic land-use and several features in the eastern portion of the survey area might be associated with small-scale sedentary agriculture.

In discussing the characteristics of the various classes of sites and features recovered, comparisons will be drawn between the settlement characteristics and land-use patterns of the Upper Tigris Region and the better-studied north Jazira in Syria and Iraq. As was discussed in Chapter 3, the Upper Tigris is the northern-most of the plains that can be considered part of northern Mesopotamia. Like the north Jazira, the Upper Tigris basin is an alluvial landscape marked by mounded tell sites whose populations have been engaged in rain-fed agriculture and pastoral nomadism since the Neolithic. Both areas have also witnessed diachronic shifts in a greater reliance on agriculture or pastoralism. The Upper Tigris receives significantly greater annual rainfall, but, as the data below will show, the settlements in the area are smaller than those of the Jazira. The Upper Tigris has far more restricted areas of deep alluvial soils, and pre-modern agriculture seems to have been practiced much less intensively than it was in northern Syria and Iraq. These differences probably reflect a greater dispersal of population, and a greater degree of flexibility in agricultural and pastoral land-use systems in the Upper Tigris throughout most periods. This higher degree of dispersal of population and greater degree of flexibility might correspond with frequent shifts in the location and amount of available pastureland.

Dating of Landscape Features

An issue common to both the western and eastern parts of the survey area is the difficulty in establishing the chronology of many surveyed features. Mounded tell sites with stratified habitation layers and the talus slopes of caves typically have chronologically diagnostic ceramic sherds and stone tools among their surface assemblages. However, the dating of short-term habitation sites, non-habitation sites, and landscape features is typically more difficult. Such sites and features often were not the locus of intensive, long-term, and/or spatially-contained human activity and thus have a much lower density of material on their surfaces. These small surface assemblages often do not contain chronologically diagnostic artifacts. Survey of cemeteries, cisterns, cairn fields, and check dams often yielded few to zero diagnostic sherds, and field scatters were frequently composed almost entirely of highly fragmented undiagnostic body sherds. Determining the initial date of creation and the complicated subsequent use-histories of many sites and landscape features required radiometric dating methods and excavation programs that were not possible to undertake within the scope of the Hirbemerdon survey permit.

Such problems are particularly acute in the case of sites and features resulting from pastoral nomadic activity. Instead of heavy ceramic vessels, pastoral nomads have often used containers of lighter, more ephemeral materials that do not survive in the archaeological record (Arnold 1985). There are some cases where pastoral nomad populations produced and used pottery (e.g., Barnard 2008) and pastoralists in the past may have used pottery more than ethnographically-documented groups did (Hole 1978: 150-1). However, mobile groups in general seem to have made “technologically and aesthetically inferior” (Alizadeh 2008: 103) pottery in comparison to sedentary people (see also Smith 2008: 273). This fact makes it likely that the ceramic sherds found on campsite surfaces will be highly fragmented and unrecognizable. Pastoral nomads also tended to carry small numbers of belongings on migrations, and their campsites were often inhabited for short periods of time. All of these factors result in a situation

where archaeological surveyors are unlikely to have access to substantial, chronologically-sensitive surface assemblages (e.g., Cribb 1991b: 65-83; Eerkens 2008: 309-310). Where ceramic scatters are present, the sherds may also be undiagnostic because the pottery forms used by pastoral nomad groups did not necessarily resemble those used by the sedentary people who lived in the stratified, excavated settlements from which ceramic chronologies are necessarily developed. A related problem is that many of the campsites likely date to the last 500 years, a period for which the pottery chronology has not been established in the Upper Tigris region. As in most areas of the Middle East, archaeologists in the Upper Tigris primarily focus on time periods from the Paleolithic to the Classical Age, leaving the Islamic period and especially the Ottoman period poorly understood from a material perspective (Baram and Carroll 2000: 3-4).

In the absence of reliable data concerning the date of many sites and features, I have relied on indirect evidence to formulate hypotheses about the chronology of settlement and land-use in the Hirbemerdon Tepe area. These lines of indirect evidence include site/feature taphonomy, spatial relationships between dated and undated features, and historical data. Hopefully it will be possible to test the hypotheses suggested by such evidence in the course of ongoing and future research. The sites and features identified and mapped via satellite imagery are outside of the permitted survey area and were not visited. The dates of these sites and features are thus completely unknown, and the best way to address their chronology is through future research. Dates can in some cases be proposed based on similarities to known features in the HMTS survey area.

Modern Pastoral Nomadic Land-use According to Sedentary Villagers

Brief, opportunistic ethnographic interviews conducted by members of the survey team illustrate aspects of the current situation for the very few pastoral nomad groups who still winter in the Upper Tigris River Valley. For political reasons, it was not possible to interview the

villagers of Tepekonak, who are former pastoral nomads of the Beritanlı tribe that settled in the Hirbmerdon Tepe area in the 1980s. Villagers from Merdani and Şahinli, the two villages on either side of Hirbmerdon Tepe, were interviewed in the summers of 2008 and 2009. These villagers were vague in their knowledge of the migration routes for groups who rented winter pastures in the surrounding area. Different individuals indicated several summer pasture destinations for groups wintering in the area: Bingöl, Erzurum, and the mountains west of Van. These destinations would correspond to those described for Batman and Garzan groups in the 1940s (Frödin 1943). In March 2010, inhabitants of a tent camp located along the Bismil-Batman road in the vicinity of Salat Tepe (and Çetikli, the other Beritanlı village in Bismil İlçe) indicated that they had originally migrated to Muş in the summers, but were now attached to an (unnamed) nearby village.

The vague information given by villagers in the Hirbmerdon Tepe region undoubtedly stems from the lack of consistency in camping and herding patterns from year to year, due to land fragmentation, sedentarization, and high rental fees. A group reportedly rented fields near Şahinli during one winter some years prior to 2008, but had not returned to the area since then. Villagers east of the survey area told similar stories about sporadic field rental in March 2010. An elaborate campsite studied by the Hirbmerdon Tepe Survey, described below was reportedly inhabited in the winters of 2008 and 2011. It is possible that the remaining winter camps in the region belong to sedentary or sedentarized groups who reside in the cities and villages of Diyarbakır and Batman province. Further, it is high likely that any groups practicing a degree of migration appear identical to sedentary villagers because they live in permanent dwellings during the winter.

Sites and Features Identified by the HMTS

Survey of the western river terraces and surrounding steppe-plain found six morphological classes of sites. Preliminary full coverage survey and subsequent targeted mapping efforts identified and investigated mounded sites, cemeteries, cairn fields, hunting blinds, and caves. Additional siteless methodologies identified unmounded sites and field scatters. Survey of the eastern uplands found eight morphological classes of sites. Full coverage transect-based survey and subsequent targeted mapping efforts identified and investigated inhabitation sites, cemeteries, cairns, hunting blinds, cairns, cisterns, isolated corrals, and check dams.

Inhabitation Sites

Mounded sites

The inhabitation sites mapped in the western part of the survey area included five mounded tell sites identified on the basis of topography (6.1). Sites with a mounded morphology were only found on the western plain-steppe and were uniformly located adjacent to seasonal drainages in areas with substantial level land for agricultural fields. The tells in the HMTS area showed a remarkably consistent pattern in their distribution across the landscape at relatively regular intervals of 2.7-4.4 kilometers from each other.

Tells result from continuous occupation, often over millennia, associated with substantial mudbrick and stone architecture repeatedly constructed in the same locations (Figure 6.2). As in other parts of northern Mesopotamia (Wilkinson, et al. 2004), the HMTS tells were primarily the products of inhabitation dating to the Iron Age period and earlier, with both pre- and post-Iron Age occupation occurring in “lower towns” surrounding the mound. These lower towns are either unmounded or only slightly mounded. On the basis of surface ceramics, the HMTS mounds appeared to have their origin in the Late Chalcolithic, Early Bronze, and Middle Bronze Ages, with the majority of the archaeological deposition on the mound itself likely relating to inhabitation in the Early Bronze, Middle Bronze, and Iron Age periods. All five were inhabited

during the Middle Bronze Age. Four of the five HMTS tells were surrounded by lower towns evidenced by ceramics of the Bronze Age, Iron Age, and Islamic periods. Three of the five tells additionally had Ottoman period and twentieth to twenty-first century inhabitation in their uppermost levels.

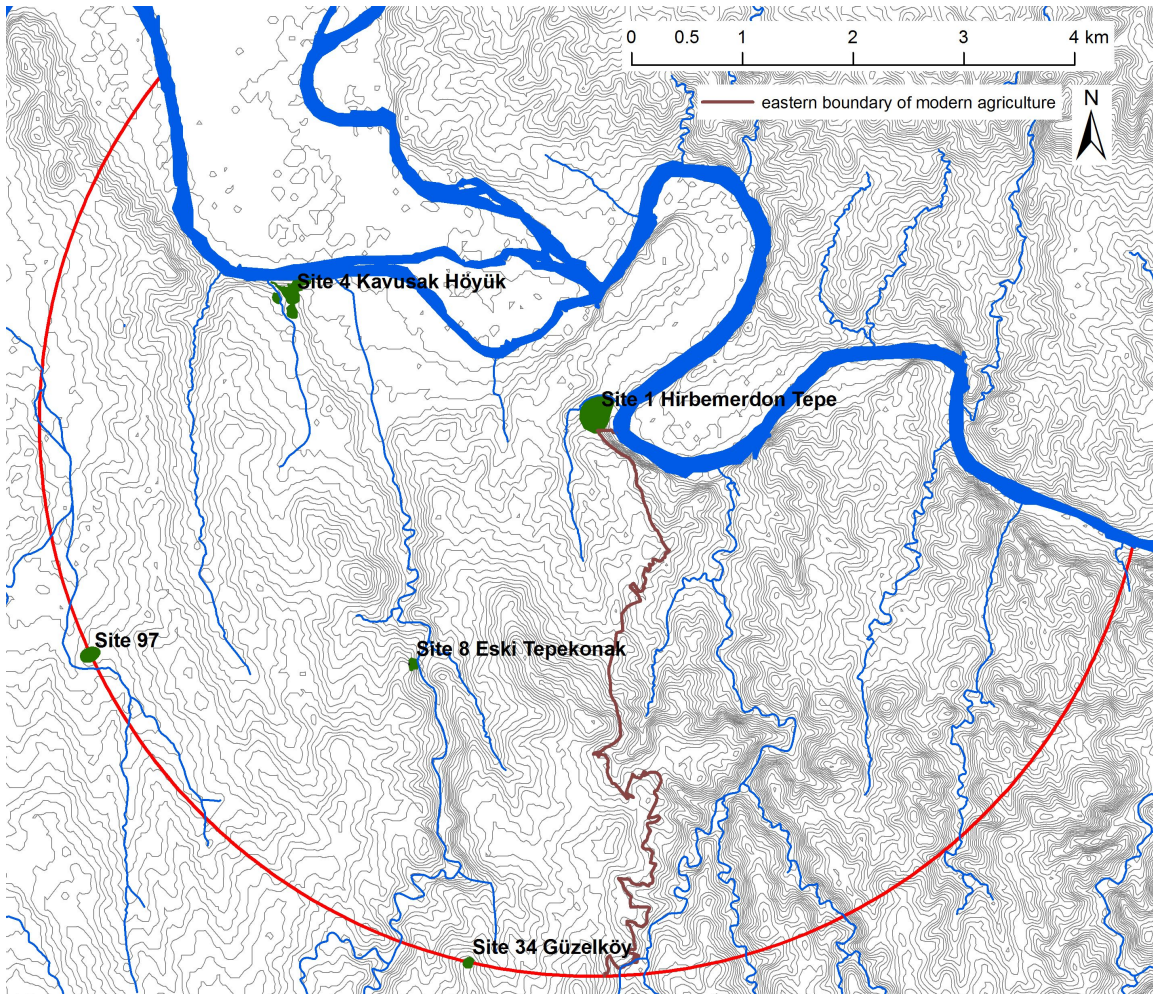


Figure 6.1: Mounded sites surveyed by the HMTS.

The average size of the HMTS mounds is small (1.35 hectares) in comparison to the average size of mounds in the adjacent parts of the Upper Tigris River Valley (50 tells average 5.46 hectares, including 8 mounds over 10 ha) and more distantly in the northern plains of the Iraqi and Syrian Jazira (in the Tell Beydar survey area, 18 tells average 4.1 hectares; in the Tell

Hamoukar survey area, 8 tells average 9.97 hectares). Additionally, tells in the western part of the HMTS area were all under 10 meters in height, compared to mounds of up to 20 meters in height in the broader Upper Tigris Region (Algaze, et al. 1991), and mounds of up to 45 meters in height in the north Jazira (Ur 2010; Wilkinson and Tucker 1995). Although it is difficult to compare settlement density and lower towns have not been measured at many sites, the conservative size of the HMTS tells suggests that smaller communities inhabited them and also suggests shorter term or less intensive settlement at those locations.



Figure 6.2: View of Hirbemerdon Tepe from the northwest, looking southeast, showing the excavation of the Middle Bronze Age and Iron Age levels in 2007.

The lesser intensity of agriculture in the Upper Tigris River Valley is also suggested by the apparent lack of the landscape features termed “hollow ways” surrounding sites in northeastern Syria and northern Iraq (Ur 2010; Van Liere and Lauffray 1954-55; Wilkinson

1993). In the Jazira, linear features argued to represent roads and tracks radiate from Bronze Age tells. The presence of these roads seems to indicate long-term stability in the patterns of movement and agricultural fields related to these Bronze Age settlements (Figure 6.3). Linear routes to and from a settlement would only appear in the archaeological record if used for long periods of time by humans and animals in areas where their paths were constrained by the layout of surrounding agricultural fields. Thus, the presence of hollow ways has been used as a proxy for the extent of intensive agriculture surrounding Bronze Age sites (Ur 2010; Ur and Wilkinson 2008; Wilkinson 1994).

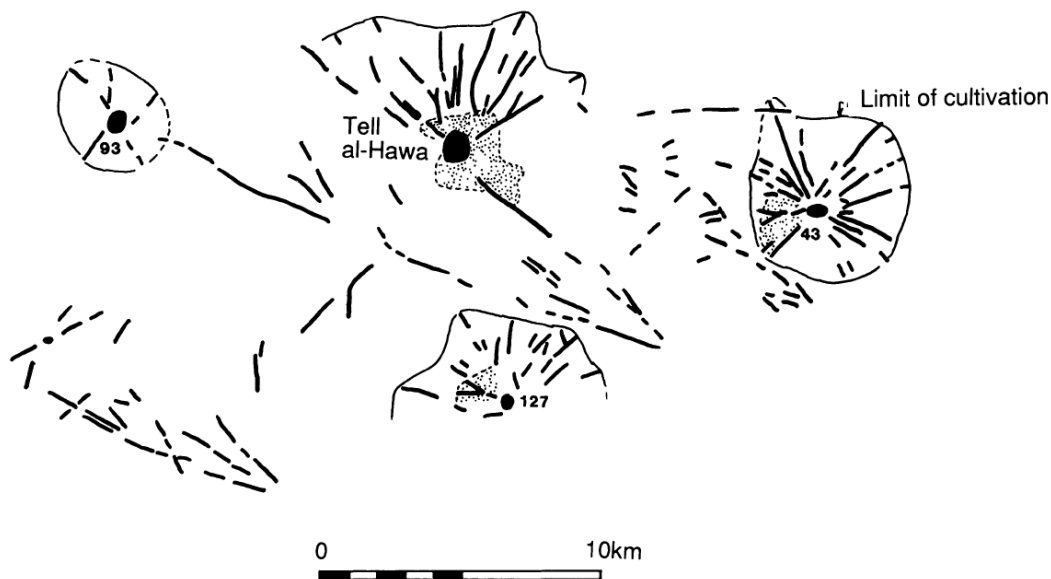


Figure 6.3: Hollow ways indicating the limits of agricultural fields surrounding Early Bronze Age sites near Tell al-Hawa in the Iraqi Jazira. After Wilkinson 1994: 493.

The lack of such features around the tells of the Upper Tigris River Valley suggests that the Bronze Age field systems in this area of northern Mesopotamia may have been organized differently and perhaps were more flexible. It was been argued that hollow ways in the Syrian Jazira were primarily formed through the movement of people and especially animals to and from the settlement (Ur 2010: 153); perhaps animals were not housed in settlements in the Upper Tigris. The smaller communities of the Upper Tigris may not have been large enough to result in

the formation of deeply incised tracks that survived subsequent millennia of land-use. Hollow ways are indicative of “zoned landscapes” with distinct agricultural and pastoral areas (Wilkinson 2003: 216). The Upper Tigris River Valley may never have been clearly divided in such a way, or may have been characterized by more dispersed agricultural and pastoral areas. Shifting field boundaries would result in a situation where movement to and from the settlement was not constrained to set paths. The various possibilities proposed are not mutually exclusive, but given the high degree of flexibility in the year-to-year locations of agricultural fields today, discussed in Chapter 3, this final suggestion seems most likely. Further archaeological indications of a lesser degree of agricultural intensity are presented in the section below on unmounded sites and field scatters.

Hypothetical sustaining areas for the mounded sites were modeled as circular buffers first on the basis of the mound area and second on the basis of the maximum area that could have been settled (mound, lower, and outer towns combined) (Figure 6.4). Except in the case of Hirbemerdon Tepe, the second buffer is a minimal sustaining area, as the edges of the lower towns of the other mounds have not yet been mapped. The calculations made the following assumptions: a settlement density of 100 persons/hectare, a crop requirement of 250 kg of cereals/year/person, a yield rate of 1000 kg of cereals/hectare, and a biennial fallow pattern for fields. Buffers were expressed as circles for sites away from river and as fractions of circles for Hirbemerdon and Kavuşak, which are located on the river and therefore could only extend their fields in certain directions. The figure of 1000 kg of cereals/hectare and the assumption of biennial fallow comes from the Turkish village inventories. The inventories provide yield estimates for different types of land and different crops. The Bismil İlçe (district) statistics show that in the early 1960s, before the introduction of widespread mechanized agriculture, arid land above the river terraces (*kıraç*) under rain-fed conditions (*kuru*) yielded 480-3000 kg of wheat (*buğday*)/hectare and 1000-2000 kg of barley (*arpa*)/hectare. For comparison, the modern national average for Turkey is 2600 kg of cereals/hectare. As the Hirbemerdon Tepe area is

located on the stone edges of the Upper Tigris River plain, in one of the more agriculturally marginal areas in Bismil İlçe, cereal yields were probably towards the lower limit of these ranges. In Bismil İlçe, 93.2% of fields were under a biennial fallow rotation and an additional 6.5% of fields were kept fallow for more than one year (İşkân Plânlama Dairesi Başkanlığı 1966a: 47-49).

The hypothetical sustaining areas calculated on the basis of the maximum possible inhabited areas for Kavuşak and Hirbemerdon substantially overlap with one another. These two sites had a great degree of chronological overlap, and if they were maximally occupied at the same time, inhabitants may have had to extend their agricultural fields further away from the river. Additionally, the communities at these sites could have traded with other nearby communities upstream for additional cereals, as the Tigris provides low-cost transportation.

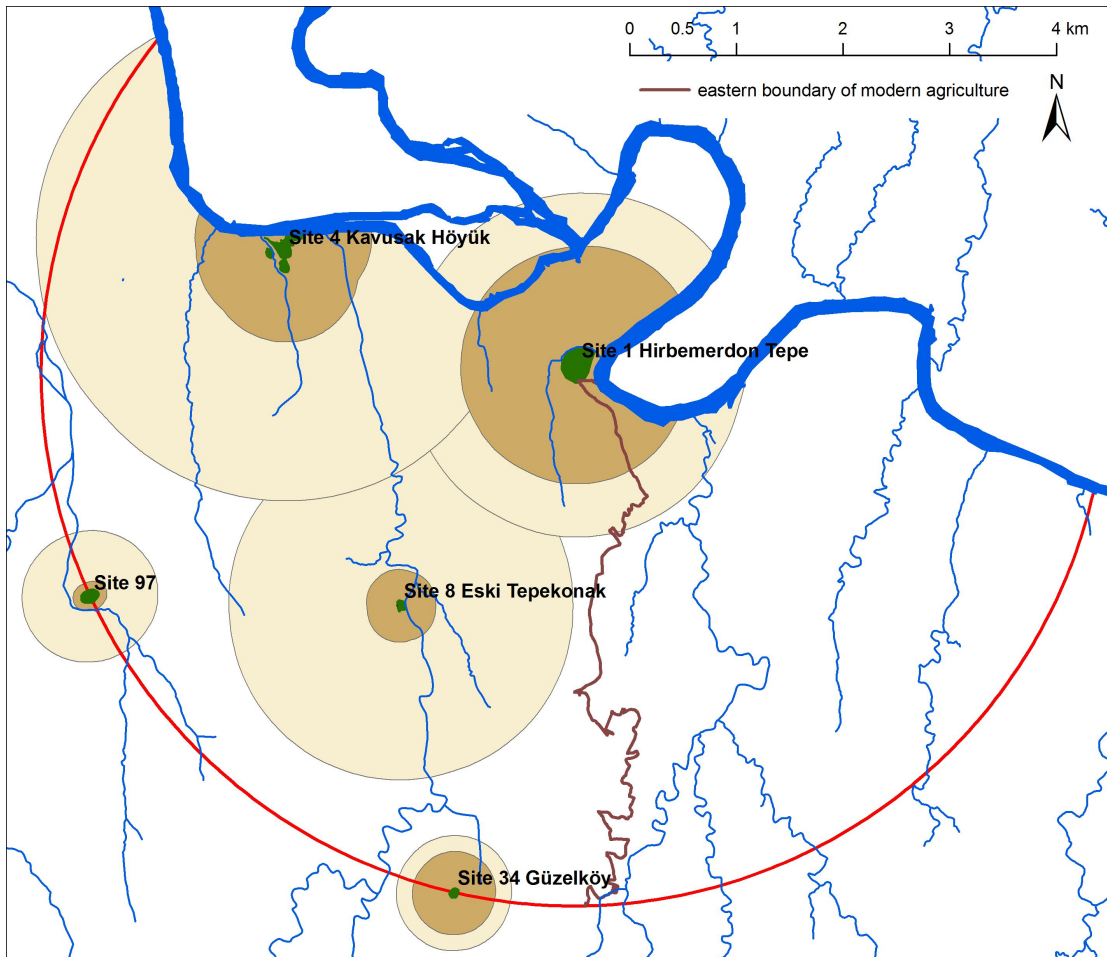


Figure 6.4: Hypothetical sustaining areas for mounded sites identified by the HMTS.

Wilkinson's model of land-use in the Jazira during the Bronze Age is one of the few landscape models that specifically and empirically considers the location of pasturelands. This model placed dense, intensively farmed fields in the immediate hinterland of mounded sites and pasturelands in the areas between the hinterlands of these sites. The interface between intensively farmed areas and pastureland was indicated by the extent of radial hollow ways, as discussed above. Although I have argued above that this model of land-use is not applicable in any period to the Upper Tigris River Valley, it is still likely that the areas outside of the hypothetical sustaining areas are the most likely areas to have consistently been used as open pasture over the last several thousand years. Farmers would likely place their fields as close as possible to their settlements for reasons of security and minimal transportation effort, leaving areas beyond these fields open for animals. The difference between the Bronze Age Jazira and the Upper Tigris could be that the position and division of these fields may have been less fixed in the Upper Tigris. Thus, the areas beyond site sustaining areas were never the only areas used as open pasture.

Unmounded sites and field scatters

Artifacts are not limited to the discrete places archaeologists term "sites," but instead are dispersed across the landscape at variable densities. Identifying the patterns within these variable densities requires the siteless survey methodologies discussed in Chapter 5. The field methodology included the collection of both ceramic sherds and worked lithic fragments. However, the resulting sites at present have been defined only on the basis of ceramics because the lithic collections were subject to surveyor bias.

The HMTS' siteless methodologies in the western part of the survey area resulted in maps of surface artifact density across agricultural fields, that is, maps of "field scatter" (Figure 6.5). The interpolation methods described in Chapter 5 were used to identify and define areas where the concentration of ceramic sherds were above a certain threshold and therefore high

enough for that area to be considered a “site.” These sites were unmounded and could not be distinguished from the surrounding area by crop marks or soil discoloration (Figure 6.6). They were thus unidentifiable on the basis of topography or satellite imagery, and their detection required the intensive survey methodologies that the HMTS applied. However, the intensity of these methodologies meant that the team could only cover a small percentage of the survey area. Thus, the locations of unmounded sites at present does not permit analysis of the diachronic distributions of such sites.

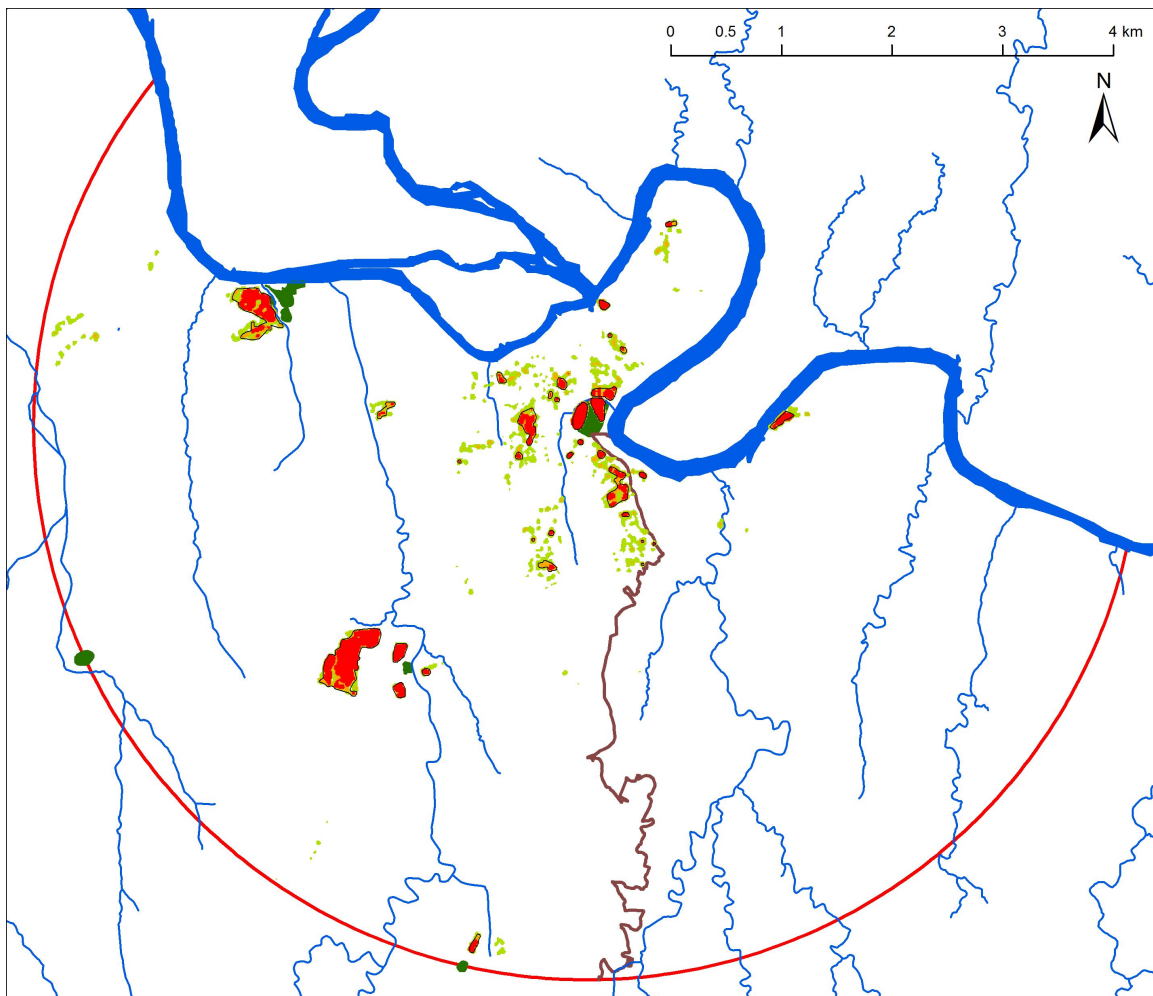


Figure 6.5: Interpolation of ceramic sherd densities from field transects collected by the HMTS to define unmounded sites.

Fourteen unmounded sites were defined from interpolated field densities (Figure 6.7). These sites dated to a range of periods, including the Bronze Age, Iron Age, Hellenistic period, Islamic period, and potentially also the Neolithic, and ranged in size from only a fraction of a hectare to greater than 15 hectares. The team concentrated their siteless survey methodologies around the mounded sites, and accordingly, the five largest of the unmounded sites were adjacent to and contemporary with mounded sites: Hirbemerdon Tepe (lower and outer towns to north), Kavuşak (lower town to west), Güzelköy (lower town), and Tepekonak (dense field scatter to west). The unmounded sites further away from the mounded sites, where the surface assemblages included diagnostic artifacts, all dated to the Islamic period and potentially the Neolithic.



Figure 6.6: Fieldwalkers spaced at 25 meter intervals while walking transects across unmounded site 8.03, a dense scatter of Hellenistic ceramics.

Unmounded sites were the product of settlements whose occupation was not of a sufficient intensity or duration to result in a significant in-situ accumulation of architectural and artifactual remains. Such sites may also have resulted from the repeated plowing of low archaeological mounds. Surface survey provided some idea of the size of unmounded sites, but did not suggest the type of site. Even with excavation, the interpretation of such sites would probably prove difficult given the likely shallowness of the archaeological deposits and the destruction of these deposits by subsequent land-use. Possible interpretations of the sites include short-term sedentary habitation sites, single isolated farmsteads, campsites of pastoralists or other nomadic or migratory groups, and fieldhouses for agricultural workers. The size and density of ceramic clusters, in some cases, ruled out some of these possibilities. For example, the extremely high density of Hellenistic sherds spread over at least 10 hectares at site 8 probably indicates that this was some type of short-term sedentary settlement; the present distribution could either reflect the original extent of the settlement or the leveling of a low mound. Fieldhouses and campsites, even if used or re-used over long periods of time, would not create such a large, dense ceramic scatter. However, there would be no clear surface features distinguishing between smaller sedentary sites, campsites, and fieldhouses, so the interpretation of small unmounded sites remains difficult.

How should we interpret the remaining field scatter beyond the statistically-defined edges of unmounded sites? In Mediterranean and Near Eastern surveys, this field scatter is frequently called “background noise” (Gallant 1986) or “off-site pottery distributions” (Bintliff and Snodgrass 1988) and is assumed to result from continuous human movement across the landscape (Bintliff and Snodgrass 1988), low-intensity activities outside of the settlement (Gaffney, et al. 1985), or the fertilization of fields with manure (Wilkinson 1982). In northeastern Syria and northern Iraq, field scatter has often been attributed to ancient manuring practices as part of a model of the relationship between third millennium urbanism and intensive agriculture (Wilkinson 1994). The alluvial plains of northern Mesopotamia are covered by a carpet of small

and abraded sherds, especially dense in the immediate hinterlands of Early Bronze Age sites. Sherd scatter resulting from manuring practices has been distinguished from sherd scatter resulting from settlement on the basis of the condition of the sherds, with small, highly abraded sherds attributed to manuring and larger, less worn sherds attributed to settlement. The manuring interpretation has also met with considerable criticism, with many archaeologists pointing out that there could be multiple overlapping and ultimately indistinguishable explanations for off-site pottery distributions. However, the low density, continuous distribution of highly abraded sherds in the Jazira was most likely the product of ancient manuring practices (Ur 2010: 65-66, 74-76).

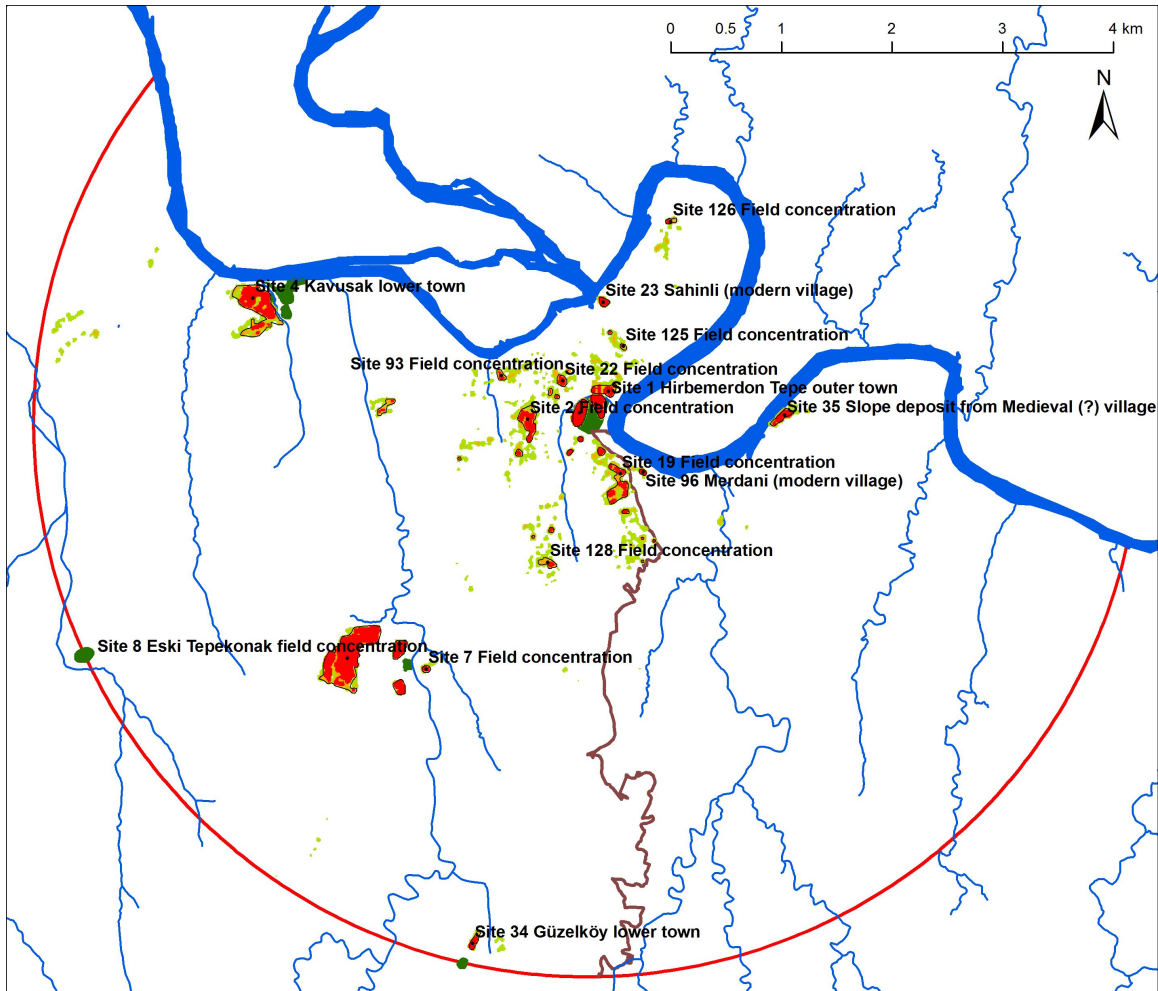


Figure 6.7: The fourteen unmounted sites defined by the HMTS and surrounding field scatter.

The landscape of the Upper Tigris terraces presented a different picture. Instead of densities that declined steadily with distance from mounded sites, these scatters were characterized by small concentrations amidst the general background density. This suggested that fertilizing fields through the application of manure was not practiced at the east end of the Upper Tigris River basin or was practiced less intensively or on a very limited spatial scale. The low level of “background noise” in the HMTS region facilitated the identification of lower-density concentrations of ceramics that might represent short-term sedentary or transhumant habitation. In the north Jazira, such lower-density concentrations would be difficult to identify amidst background scatter. In the HMTS region, small concentrations such as sites 2, 19, 22, 93, 126, and 128, as well as the small isolated concentrations between these sites, appeared more readily against the background density. Field scatters in other areas of northern Mesopotamia have been argued to represent “offsite” landscape elements; in the Upper Tigris field scatters were more likely to mark the locations of former sites on the basis of sherd density and morphology. Two interpretations are possible. The field scatters could have been small villages or isolated farmsteads whose foundations were disassembled after their abandonment for the expansion of agricultural fields. Most of the current agricultural fields had substantial stone clearance piles on their fringes, which could equally result from the stones naturally in the soil and from former architectural features. Alternatively, low-density field scatters may have marked the former locations of seasonal campsites with little or no permanent architectural features.

The other substantial difference between landscape transformation in the alluvial plains elsewhere in northern Mesopotamia and field scatter in the Upper Tigris region was chronology. The most visible pre-modern landscape transformations in the Jazira typically date to the third millennium. This is the period in which mounded settlements expanded into urban centers associated with intensive agriculture and pastoralism (evidenced by field scatters and hollow ways) (Ur 2010; Wilkinson 1994). In the area around Kurban Höyük in the Lower Karababa basin along the Euphrates River, the most visible period of agricultural landscape transformation

(evidenced by field scatters) dated to the Hellenistic, Roman, and early Byzantine periods (Wilkinson 1990). By contrast, the Upper Tigris did not seem to have one period of highly visible landscape transformation. Like in the Jazira, the most highly visible sites were the tells of the Bronze and Iron Ages. However, there was no single identifiable period of highly visible transformation of the landscape related to agriculture—no period of highly visible irrigation or path features, no association between field scatter and sites of a certain period.

If we use general field scatter as an proxy for potential landscape use and transformation, the major period of land use in the eastern uplands appeared to be Medieval Islamic. As discussed in Chapter 5, field scatters were not systematically mapped in the eastern uplands. However, where field scatters were encountered in and around campsites and caves, the diagnostic sherds were primarily Medieval Islamic in date.

Campsites

Eighteen campsites were identified on the basis of stone features and foundations (Figure 6.8). A number of factors indicated that these are sites of pastoral nomads. These included the presence of animal corrals and litter related to animal care as well as the presence of structures that correspond well to features ethnographically documented in pastoral nomad campsites. It was difficult to date these campsites because of the general lack of chronologically-sensitive surface assemblages. Where pottery scatters were present, on campsite surfaces and in the eastern uplands as a whole, the sherds were dated to the thirteenth to fourteenth century AD. We thus suspected that the most of the campsites recovered date from the last 600-700 years.

All campsites were located on flat areas adjacent to north-south seasonal streams. These areas were at an intermediate topographic height in comparison to low, incised seasonal drainages and the high ridges and plateaus between seasonal drainage systems.

Campsites at present have been divided into three classes based on features and taphonomy, which is related to the time elapsed since these sites were last abandoned. These

taphonomic classes include modern campsites, twentieth century campsites, and older campsites of an unknown date.

One campsite, site 36, was clearly modern, built within the last 4-5 years and composed of tent platforms and other structures built of reed, stone, and brush (Figure 6.9). The campsite was located at the northern end of a seasonal drainage (wadi), 550 meters from the Tigris in an area where the natural vegetation surrounding the drainage bed was particularly lush. The form

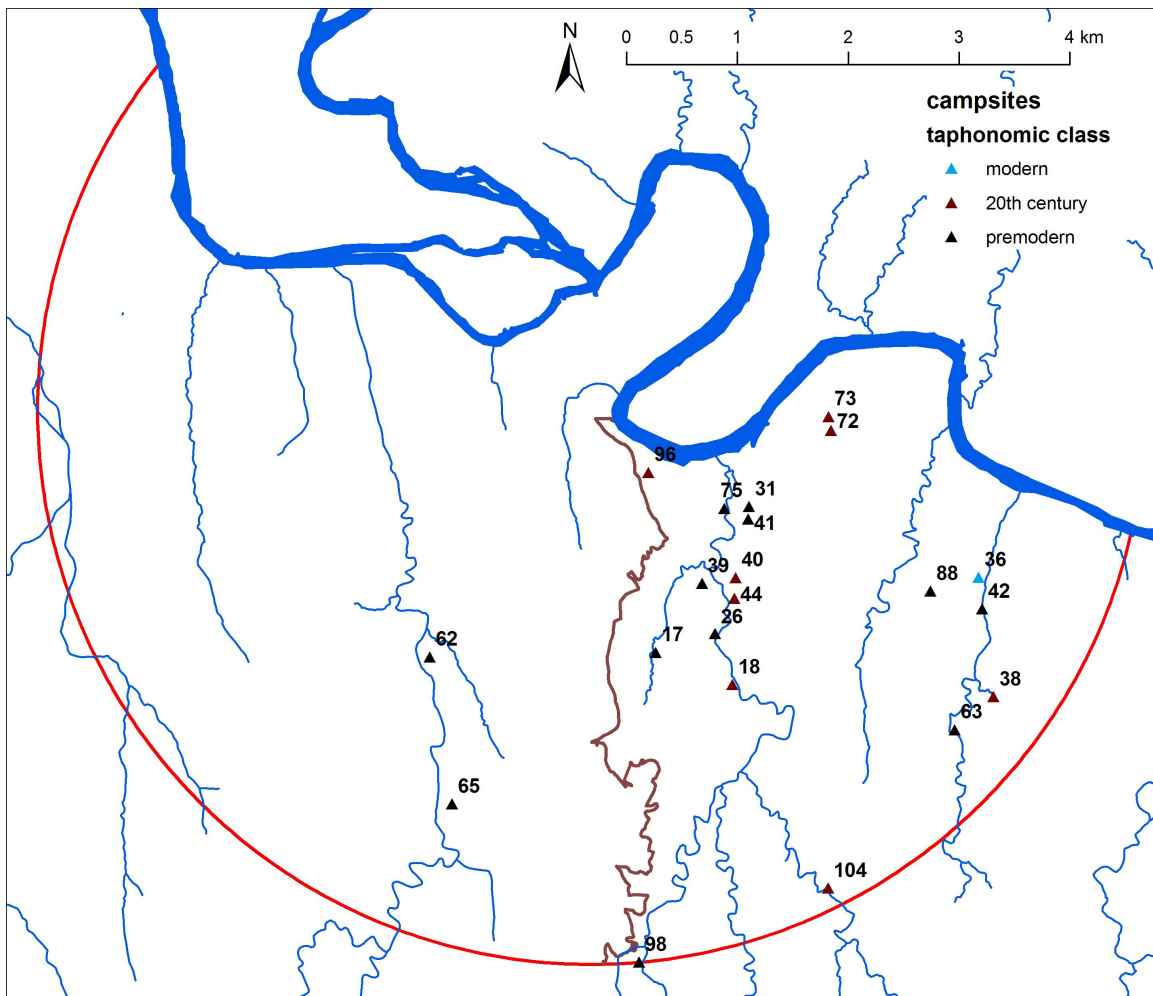


Figure 6.8: Distribution of campsites identified by the HMTS, symbolized according to their taphonomic class.

of the campsite resulted from the placement of five individual household spaces next to one another on either side of the wadi: each of the five tent platforms was surrounded by a similar constellation of features. Tent platforms consisted of clear, packed earthen surfaces outlined by shallow trenches to divert rain and downslope water flow away from the tent. Nearby were outdoor cooking areas delineated by stick fences. Each household area had a number of animal enclosures and a set of parallel animal feeding troughs. The animal enclosures showed a variety of construction methods including dry stone walls, woven brush, reed screens, and hybrids of these three techniques. Almost all of them had stone foundations surrounded by nylon sacks filled with earth for stability and doors/gates made from interlaced sticks. The floors of the enclosures had dung layers up to twenty centimeters thick, sometimes underlain by flattened brush. The feeding troughs were constructed of woven brush on top of stone foundations.

A Quickbird satellite image taken in 2004 showed no trace of site 36, indicating that it was a more recent construction. Local villagers informed the HMTS team that 6-7 households numbering around 50 persons total lived in this campsite with 3000-4000 head of sheep for 5 months during the winter of 2007-2008. The campsite apparently remained uninhabited during the winters of 2009 and 2010 and was re-inhabited during the winter of 2011. Sometime during the winter of 2009, someone returned to the campsite in a truck (evidenced by large wheel tracks) in order to remove various architectural elements and also dung. The most obviously removed elements were the earth-filled nylon sacks, which provided structural support to some corral walls, and all of the screens, gates, and corral fences constructed of woven reeds and sticks.



Figure 6.9: Modern campsite 36 from the northeast, looking southwest. Shows four of the individual household units, each composed of a single tent platform and a suite of other features including corrals, feeding troughs, and kitchen areas.

These structures were presumably either returned to the campsite or constructed anew before the re-inhabitation of the campsite in 2011. They were again removed before the summer of 2011. The screens and fences might have been removed by nearby villagers or pastoralists needing firewood, a practice documented in ethnographies of Iranian pastoralists. Given the fact that the screens and fences remained in place for at least a year, were returned or reconstructed two years later and again removed, it seems more likely that the pastoral nomad households who had inhabited site 36 transported these items elsewhere for use at another campsite. In the upland landscape it would take a considerable amount of effort to collect enough twigs to weave fencing for the more than twenty structures at the site that employed it, so it would make a great deal of sense for this fencing to be conserved and recycled in some way. The only twig elements that remained at the campsite following the winter of 2009 were the wicker feeding troughs and the stick floors of a few corrals. In addition to the removal of the twig structures, the large piles of dung cakes left at the site were removed, and all of the dung-caked corral floors were overturned. After the winter of 2011, all twig structures were again removed, including the wicker feeding troughs.

Close examination of this well-preserved, recently abandoned campsite allowed the establishment of a spatial template against which older and more fragmentary campsites could be compared. Observing this recent campsite over several years, as it was abandoned, disassembled, and re-inhabited, provided insight into the taphonomic processes differentially affecting the visibility of certain campsite features overtime as they descended from the abandoned to the archaeological realm. In particular, this recent campsite assisted with the identification and interpretation of ephemeral and easily-missed earth and stone elements associated with campsite features that were primarily constructed out of twigs, brush, reeds, and other materials that rapidly degrade. Corrals and other features constructed of organic materials were still marked years after their abandonment by the stone and dirt ridges channels dug around their outlines in

order to re-direct drainage around the structure. Preservation of this channel was always best along the outside of the upslope wall of the structure.

Six campsites have been used within the past few decades but not in recent years. The twentieth century date of these campsites seems assured by the presence of plastic among their surface assemblages and standing stone architectural features. However, the partially collapsed nature of these architectural features and the lack of organic architectural elements suggested that these campsites have not been inhabited for perhaps a decade or more. The campsites consisted of stone corrals, stone tent foundations, and cleared tent surfaces. For example, site 18 was composed of 19 rectangular stone structures with walls standing up to approximately 1 meter high and 2 packed earth tent surfaces (Figure 6.10). The presence of highly degraded dung on the floors of most of the stone structures indicated that these served as animal enclosures. Unlike at the modern campsite, where thick, fresh dung layers were highly visible under most vegetation conditions, the thinner, more degraded dung layers at twentieth century campsites such as site 18 were only visible in years of drought, when the natural vegetation was minimal. At least one structure at site 18 (structure 2) had apparently clean floors and might have served as a foundation for a tent. Mapping of artifacts (bone, ceramics, fabric, glass, lithics, metal, plastic, etc.) revealed a concentrated scatter in front of the structure, further suggesting that it was a tent footing (Figure 6.11). Site 40 had a completely different form and layout. It was composed of two packed earthen tent platforms with postholes and surrounded by ephemeral stone alignments (Figure 6.12). The preservation of postholes and the presence of a dense scatter of glass, metal plastic, and fabric across the site's surface indicated that this was a twentieth century campsite. A light scatter of undiagnostic ceramics was recovered amidst the dense scatter of modern materials.

The remaining four campsites in this second taphonomic category were found in association with complexes of cave structures. Site 72 consisted of a square enclosure and a collapsed rock structure, both located only 100 meters away from a rockshelter (site 71) (Figure 6.13). Site 38 was an extensive complex of carved caves, cisterns, tent sites, and animal

enclosures in two adjacent valleys. Within the wadis were 19 structures, variously stone-built animal enclosures, areas of former enclosures constructed of perishable materials (now removed or completely decayed), and cleared spaces for tents. On the wadi edges and cut into the bedrock valley walls were approximately 30 elaborately carved cave structures, many with multiple rooms and internal features such as benches, basins, skylights, windows, and doorframes. Most showed signs of having been used to house animals in recent years, but almost all were originally intended for human habitation, in the same manner as the cave houses of Hasankeyf. The slopes in front of the caves down into the wadi were rich with cultural material from both the caves (in the distant past) and from the tent sites (in the more recent past). The artifact scatter consisted of Middle Islamic and Ottoman period pottery as well as plastic, glass, metal, and fabrics. Neighboring site 37 consisted of a large cistern across from two rock shelters with front walls constructed of dry stones and a single-roomed cave between them; in front and sloping down to the wadi is a talus slope full of cultural material. In recent years all three features have been used as animal shelters.



Figure 6.10: Twentieth century campsite 18, composed of stone tent foundations and corrals. Top: View from the south, looking north. Bottom: Close view of stone corrals.

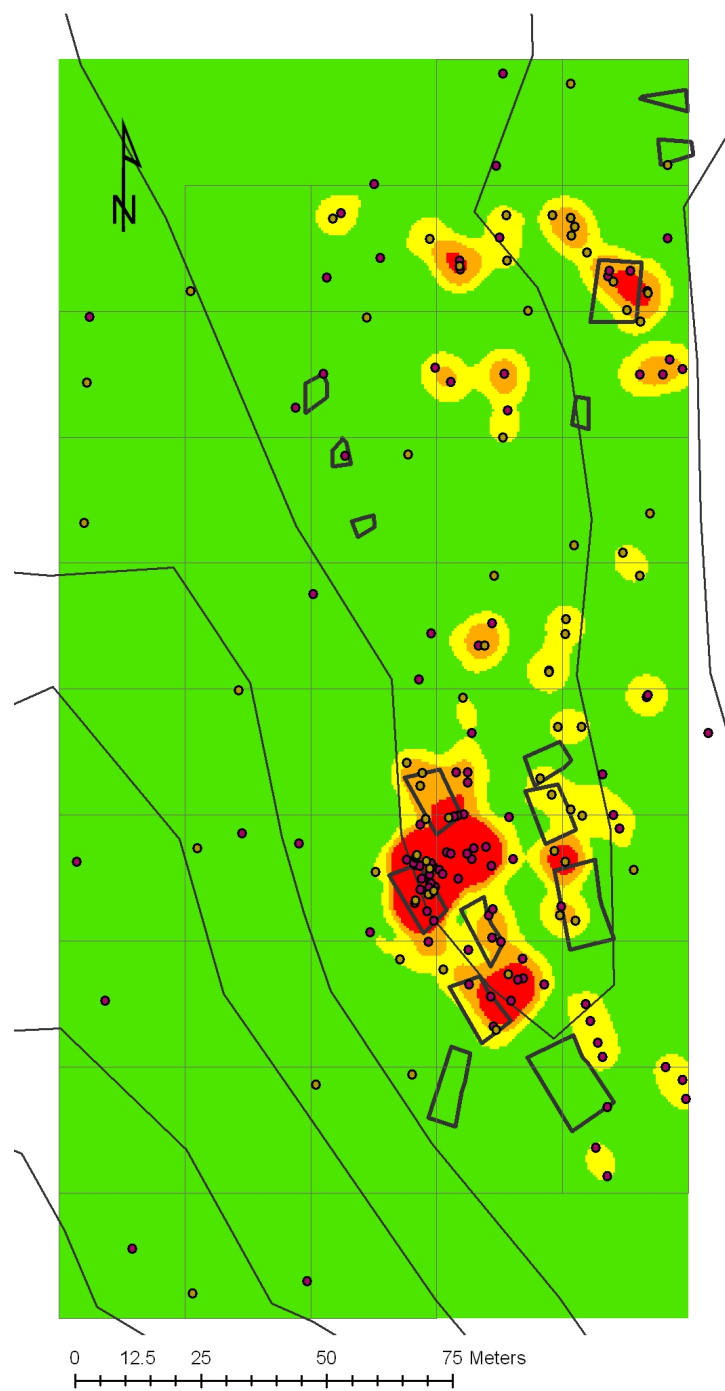


Figure 6.11: Density of artifact scatter across the surface of twentieth-century campsite 18.



Figure 6.12: Packed earthen tent surface at campsite 40.

Similarly, at Site 96, an extensive complex of caves and stone structures in a small drainage was used for animal penning and human dwelling space. The complex covered roughly 6.7 hectares and included at least 9 carved cave structures, 2 with external walled additions, and at least 8 free-standing stone enclosures. Ceramics were Islamic (including Abbasid). Again, like site 37/38, the cave structures could be much older, but the pastoral nomadic features showed signs of twentieth-century use. The inhabitants of Merdani village, only 125 meters from site 96, use caves carved into a rock outcrop south of the village for storing animal feed and agricultural tools.

Site 44 consisted of a cave pen with a 1 meter-high front wall constructed of dry stone, collapsed stone tent foundations, a collapsed corral, and a rock-carved cistern (Figure 6.13, Figure 6.18).

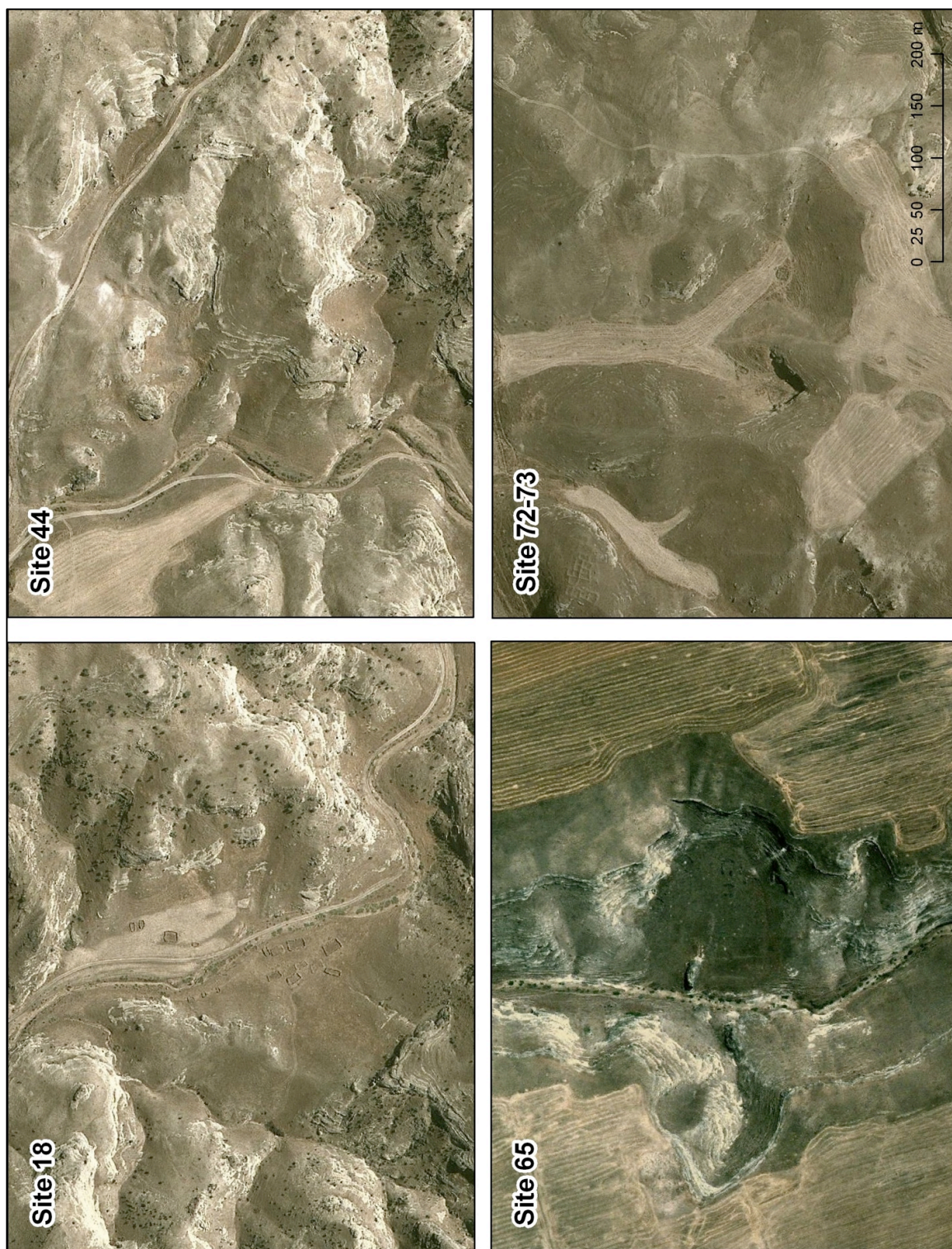


Figure 6.13: Comparison of campsite size and layout, sites 18, 44, 65, and 72-73



Figure 6.14: Comparison of campsite size and layout, sites 36, 38, and 104.

Site 104 consisted of two well-preserved stone corrals walls preserved up to 1.5 meters high positioned on the slope below a natural rockshelter (Figure 6.14). This rockshelter contained an additional, smaller stone enclosure with approximately 1 meter high walls, likely for penning juvenile animals requiring more protection during cold weather. Two potential tent footings were identified nearby on the basis of their leveled surfaces, but the dense vegetation in this area made it impossible to conclude for sure.

The difference between the famous site of Hasankeyf (Sinclair 1989) and sites such as 37/38 and 96 was one of both size and character. The cave complexes and 37/38 and 96 were considerably more modest in extent, and the caves in general were smaller than those at Hasankeyf. The primary difference, however, was in the use of space immediately outside of the caves. While the caves at Hasankeyf were surrounded by the substantial stone and mudbrick buildings of a sedentary settlement, the caves at sites within the HMTS were surrounded by dispersed stone features clearly oriented towards pastoralism. Given the presence of Medieval Islamic sherds at both sites, the exterior stone features may or may not have represented a much later re-use of a cave complex originally designed for sedentary habitation.

Ten sites lacked modern materials in their sparse surface assemblages and had highly degraded and collapsed architecture. The identification of these sites as campsites is in some cases provisional; given the degraded and collapsed nature of these sites, the form and function of their component features was sometimes difficult to identify. The chronology of these sites was uncertain, but the lack of glass, metal, and plastic in their surface assemblages suggested a pre-twentieth century date. These sites showed a wider variety of forms. The majority of campsites in this category, like the campsites in the previous two categories, only showed evidence for the use of rectangular multi-poled tents, consistent with the black goat hair tents used by ethnographically-studied groups in the Iranian and Turkish mountains. However, site 17 and potentially also site 39 were characterized by flattened circular structures that might have accommodated a different type of tent, although the use of circular, framed Central-Asian-type

tents in southeastern Turkey was not documented by ethnographers or travelers of the last two centuries (Figure 6.15). The traces of the campsites that accommodated rectangular tents were also more varied than the more recent campsites. There were two types, flattened stone outline of probable tent foundations and stone bedding platforms.

Sites 31, 42, 62, 63, and 88 consisted of roughly rectangular concentrations of stones flattened into the ground surface (Figure 6.16). These were interpreted as the remains of bedding platforms, raised areas within tents for the storage of bedding materials and other objects that should be kept dry, clean, and off of the ground surface (Cribb 1991b). Sites 26, 41, and 65 consisted of the collapsed, roughly rectangular-shaped stone walls of what were probably stone animal enclosures and tent foundations like those found at modern site 36 and several twentieth-century sites (Figure 6.17). At site 65, these collapsed structures were surrounded by additional flattened stone alignments (Figure 6.13). Most of the clear structures were positioned against a rock outcrop, with their back wall against the bedrock. In between the site and the wadi bed was a large rock outcrop into which a cave and a large cistern were carved. The cave had interior benches. The wadi terrace on which site 65 sits has recently been covered by an agricultural field, so the campsite might have originally consisted of more structures that have now been dismantled. It is impossible to say if the more ephemeral stone alignments on this terrace were the remains of other campsites structures or stone clearance features related to the farming of the field.

Stone corrals are the most visible feature of twentieth-century campsites, but pre-modern campsites did not have them. This situation could be because they were constructed of perishable materials. Even in the absence of more permanent constructions, corral surfaces often differentially supported vegetation for a long period after campsite abandonment. Thus, most animals may not have been penned near the sites or were penned in nearby caves.



Figure 6.15: Flattened circular stone foundation at site 17.



Figure 6.16: Stone bedding platform at campsite 31.



Figure 6.17: Flattened stone tent foundations (or corrals) at campsite 26.

If a “household” is associated with a single tent or dwelling space, the recovered campsites appeared to have incorporated small numbers of households. The modern campsite 36 likely accommodated five or six household units. Twentieth century campsite 18 has one stone foundation structure that likely accommodated a tent plus three cleared tent surfaces. Campsite 37/38 was set within a complex of 20 caves, 1 tent foundation, and 3 tent platforms that could also potentially have accommodated a large number of households. However, most of the older campsites of likely pre-twentieth century date accommodated only 1-3 household units. One exception is found at site 42, where 12 collapsed bedding platforms suggested a camp of up to a dozen separate households. Populations tended to be most dispersed during the winter because access to adequate pasture was more problematic than during the summer. The small size of most camping groups is unsurprising given that the region has been used as a winter camping area.

Two patterns in the organization of campsites were observed in the orientation of structure doorways. In campsites with standing stone foundations, most structures had single doorways facing the seasonal drainage or the center of the campsite. Structures in the modern campsite 36, however, had multiple doorways that faced in a variety of directions. These doorways faced all directions except toward the cleared tent surfaces. Tent entrances did not face the seasonal drainage or other tents. Instead they seem to have been placed on a side that guaranteed both privacy and separation from the corrals.

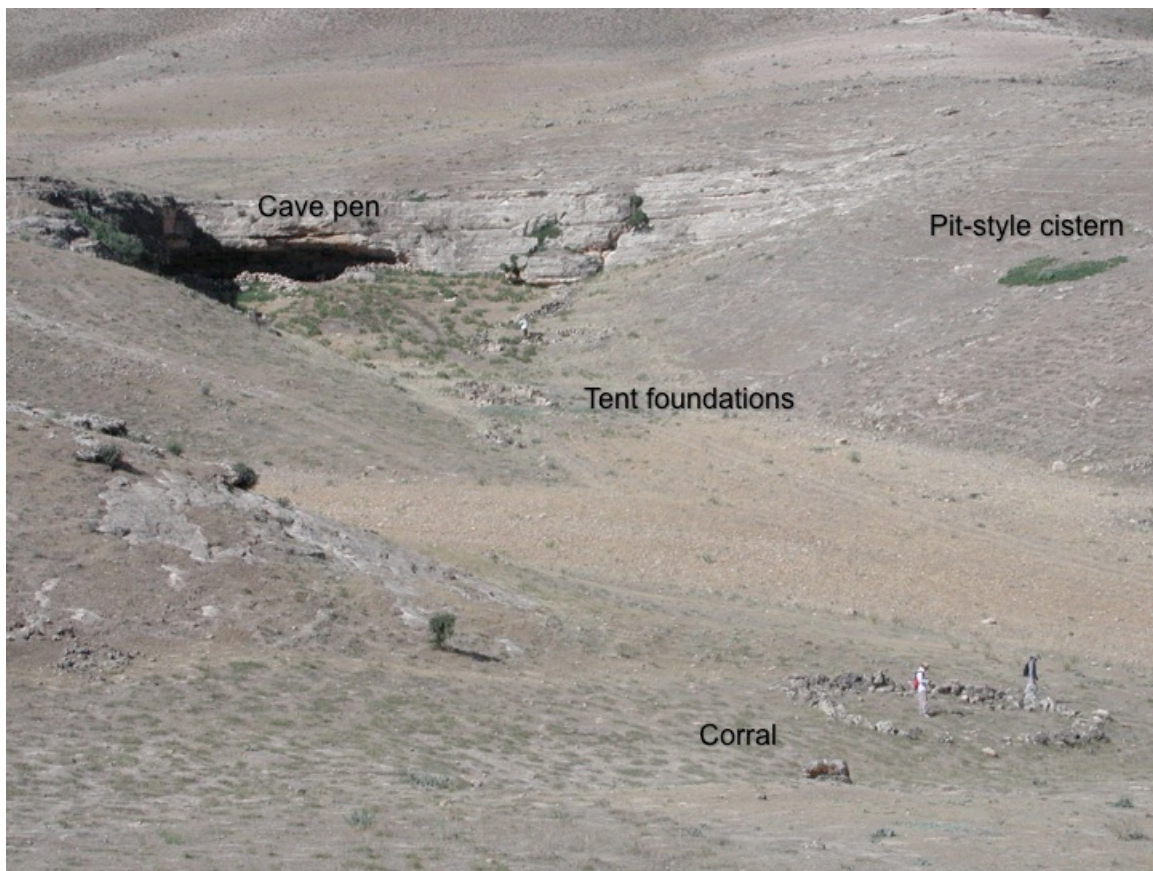


Figure 6.18: A cave pen, corral, and cistern in spatial relationship with one another surrounding a set of small corrals or tent foundations. Site 44. View from the west, looking east.

Two spatial patterns were again identified in the organization of structures around the tent space. At the modern campsite, the space around the tent surfaces was organized in a modular way. Each tent was surrounded by its own set of associated features, including corrals, a

chicken coop, and feeding troughs. At the campsite set within a complex of caves, there were at least four separate sets of corrals and feeding troughs evenly spaced throughout the site.

However, space and features may have been used in a more communal fashion at site 18.

Structures were organized into three different areas with structures of different types, and perhaps also of different functions, grouped together. One area had three small square stone structures that may have been used as tent footings, another had two medium-sized oval structures with two earthen tent surfaces, and the third had nine large stone rectangular structures.

Abandoned villages

In addition to pastoral campsites, the HMTS mapped the foundations of several abandoned agricultural villages in the eastern uplands of the survey area (Figure 6.19). Four of these villages were located within 600 meters of the Tigris River. Sites 1 (“Merdani” on nineteenth century maps) and 35 were located on high ridges above the river and were quite small. Site 35, for example, had only three recognizable house foundations arranged around courtyard spaces. Site 107 was larger and consisted of the stone foundations of a village and Islamic cemetery, and was located on the T4 alluvial terrace, immediately adjacent to the Tigris. The former village of Otlı, site 102, was abandoned in 1994 during the Turkish-Kurdish conflict. The surviving structures at Otlı, over 55 in number, stretched along both sides of two converging incised valleys, and included mudbrick and stone house foundations, corrals, cisterns, rockshelters, cave dwellings, and a concrete mosque.

The stone foundations at abandoned villages differed from the stone foundations at campsites in terms of their height, collapse pattern, layout, and associated artifact assemblages. The foundations of abandoned villages often remained standing higher than the 0.5-1 meter height of the features within campsites. Further, the foundations identified as abandoned villages were typically surrounded by significant amounts of stone collapse, indicating that they had originally stood much higher, whereas the campsite foundations were surrounded but much more

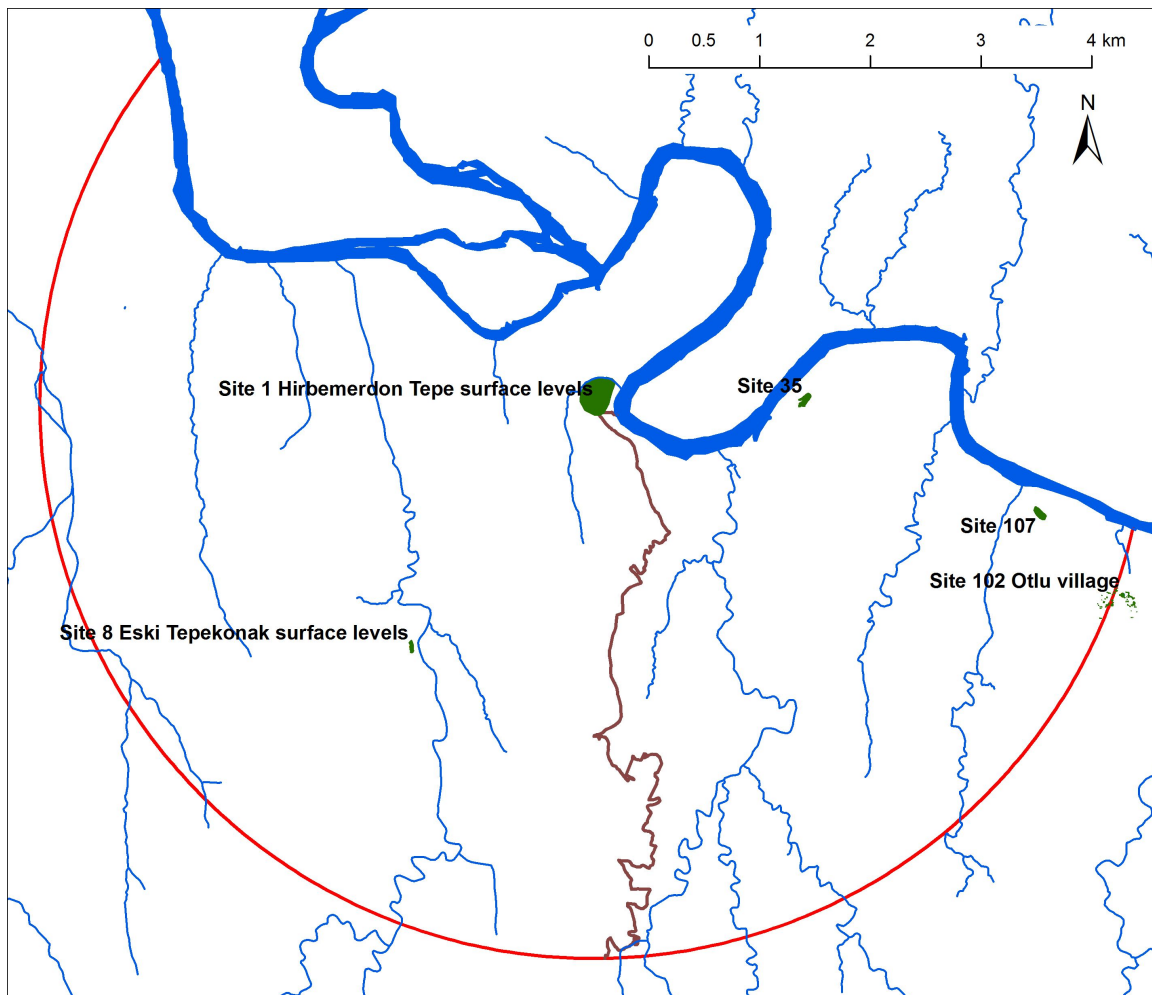


Figure 6.19: Distribution of abandoned villages identified by the HMTS.

modest amounts of stone collapse. The layout of the long-abandoned village foundations was cellular and significantly more compact than the layout of the campsites. The recently abandoned village at Otlu had a more similar layout to the campsites, with individual houses associated with one or more animal corrals. Here, the significant amounts of collapse, the height of the walls, and the “L”-shape of house foundations would have been indicative of a village if the site had been in a more collapsed state. Finally, abandoned villages differed from campsites in the significant amounts of pottery found on the surfaces of the villages.

The distinctions above on the basis of stone collapse and layout are important because these characteristics of the sites are visible from the air. They will thus be used to distinguish

between potential village foundations and potential campsites in the analysis of satellite imagery for areas beyond the boundaries of the field survey.

Landscape Features

Cemeteries

In the western and eastern parts of the survey area, cemeteries were located primarily on ridgetops and on top of tells. The HMTS identified three classes of cemeteries characterized by three different types of burials (Figures 6.20, 6.21, 6.22, and 6.23). First, undisturbed oval stone circles, presumably marking Islamic period burials, were found on top of the mounds at Kavuşak and Güzelköy, beside the abandoned villages at sites 35, 102, and 107, and in discrete concentrations at sites 43 and 118. These Islamic cemeteries were often associated with modern or recently abandoned villages in the western part of the survey area. A notable exception was the extensive cemetery at site 43 in the eastern uplands, approximately one kilometer from both of the nearest abandoned villages at sites 102 and 107, which in any event had their own associated cemeteries. This cemetery might contain the burials of pastoral nomads in the area, as it is much closer, and more easily accessible, to a number of camps at sites 36, 38, 42, and 88. The graves in this cemetery became visibly more recent from north to south, indicating that the burials had accumulated over a period of time. Rough uncut stones mark all of the graves in this cemetery, and there were no inscribed headstones.



Figure 6.20: Stone circles marking recent Islamic burials at site 43.

Second, a series of cemeteries extending over 1,800 meters along the ridgetops to the north of the village of Tepekonak contained thousands of looted burial pits. These shallow pits occurred in isolated clusters (sites 7, 9, 11, 13, 20) and were typically approximately 0.5 meter in diameter. Frequently these pits showed evidence for graves that had been lined by flat stones. Dating these burials was difficult given that the cemetery surfaces lacked artifact scatters. The location of the burials on ridges above the unmounded Hellenistic sherd scatter to the west of Eski Tepekonak suggested a Hellenistic date. Furthermore, the few sherds found near these burials had fine grit temper characteristic of Near Eastern Hellenistic pottery. The fact that so many of these tombs were looted suggests that they contained grave goods and were thus likely pre-Islamic in date.



Figure 6.21: Looted tombs at site 9, possibly dating to the Hellenistic period. Top: close view of a stone-lined burial pit. Bottom: burial pits across the site's surface.



Figure 6.22: Tombs carved into a cliff along the Tigris River, east of Hirbemerdon Tepe, viewed from the opposite (left) bank of the river.

Third, a number of single and multi-chambered tombs were carved into limestone cliffs, scarps, and promontories. By far the largest cluster was carved into the cliffs along the Tigris River and may have been of Hellenistic date. The relative inaccessibility of these structures suggested that they served as tombs, although it was also possible that the access of these structures has been impeded by ongoing erosion and collapse of cliff rock. There were only two examples of carved structures that clearly served as a tombs away from the river. One was at site 59, where a single-chamber tomb four meters in diameter, one meter in height, and of unknown date was carved into a high natural promontory. Another was at site 134, where a cluster of tombs with internal structures was cut into exposed limestone along the east slope of a deeply incised wadi.

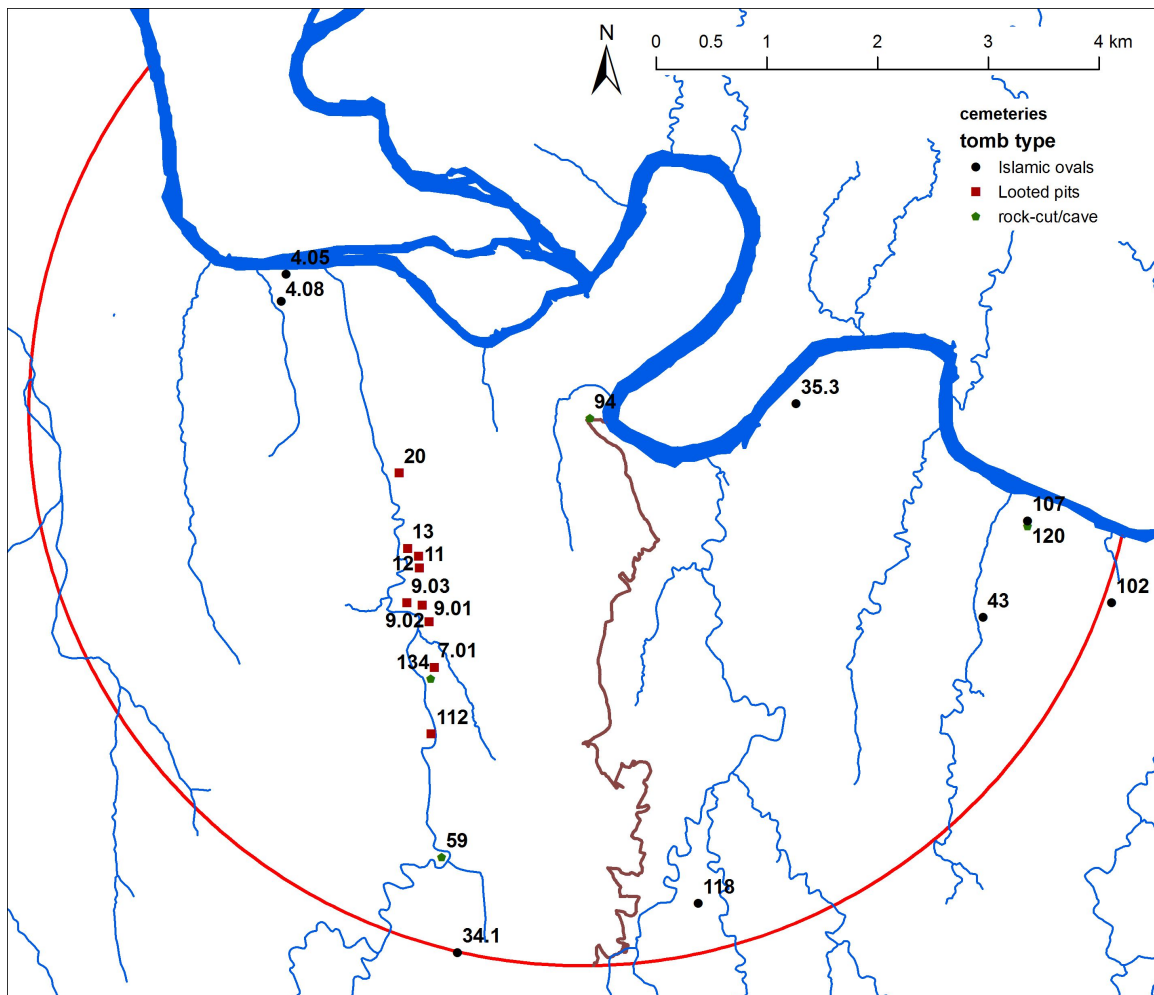


Figure 6.23: Distribution of cemeteries and individual tombs identified by the HMTS. Symbolized according to tomb morphology.

Cairns

Piles of stones were ubiquitous in the western and eastern portions of the HMTS area. These piles were generally circular and mounded, but sometimes simply flat, formless concentrations. Lichens grow on virtually all exposed, undisturbed rock surfaces in the survey area. The quantity of lichen on rock surfaces and the pattern of lichen growth was used as a relative indication of the age of cairns. Piles of rocks where lichen presence was dense and where lichen presence on individual component rocks conformed closely to the portions of the rock

surface exposed to sunlight were certainly older than piles of rock without lichen growth or with lichen growth that did not correspond to the current exposed surfaces.

On the western steppe-plain, these cairns were mostly recent piles resulting from the clearance of stones from agricultural fields in order to improve crop growth and prevent obstruction of plows. Many times the distribution of these cairns clearly corresponded to the layout of modern agricultural fields. However, the presence of cairns in the eastern uplands may not have been related to agricultural activity (Figure 6.24).

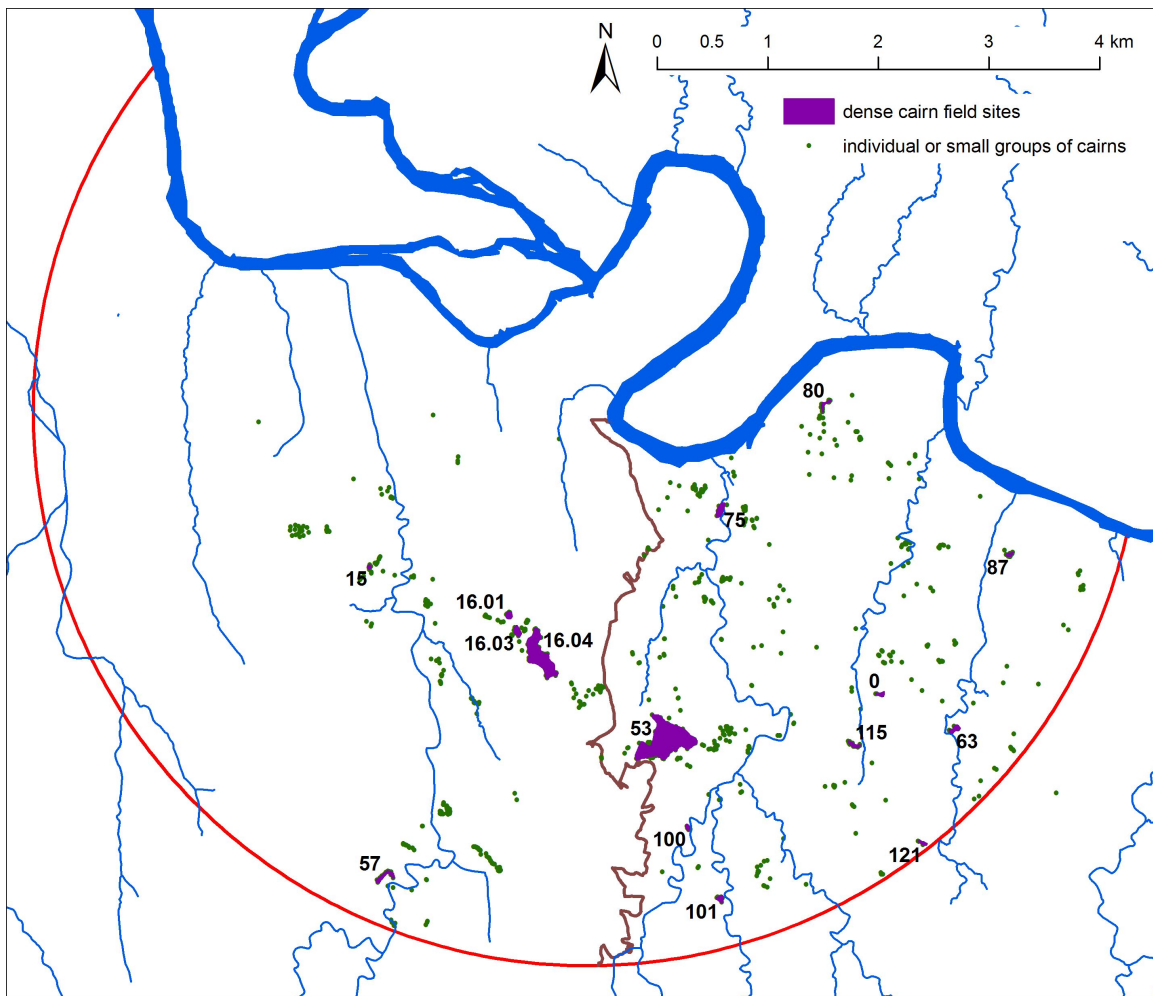


Figure 6.24: Distribution of individual cairns and dense cairn field sites identified by the HMTS.

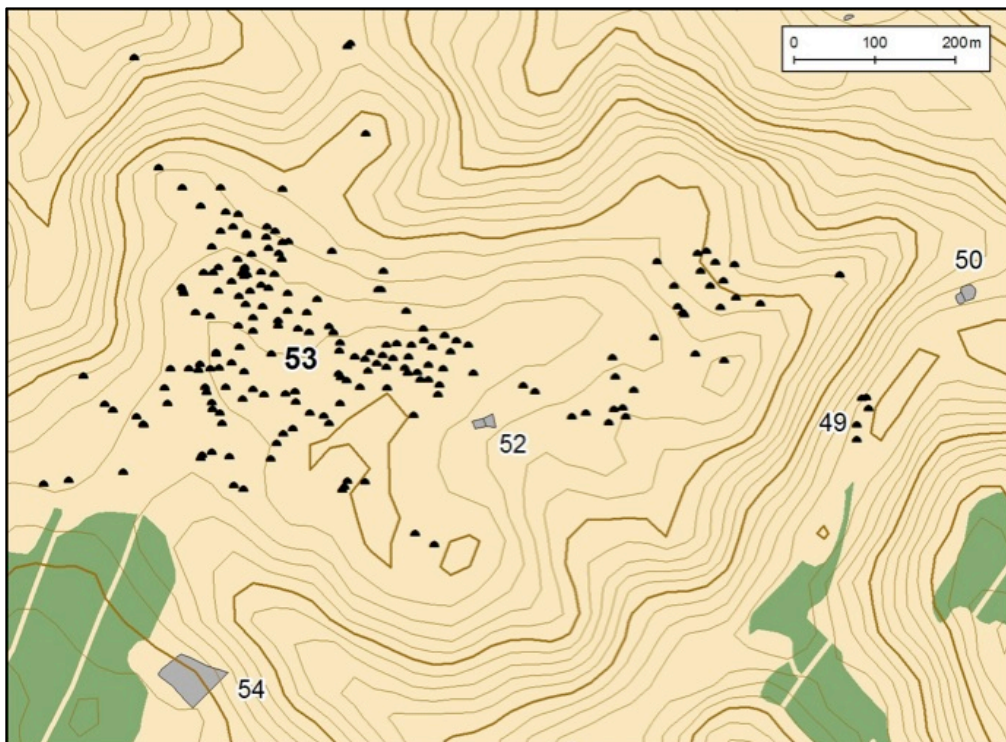
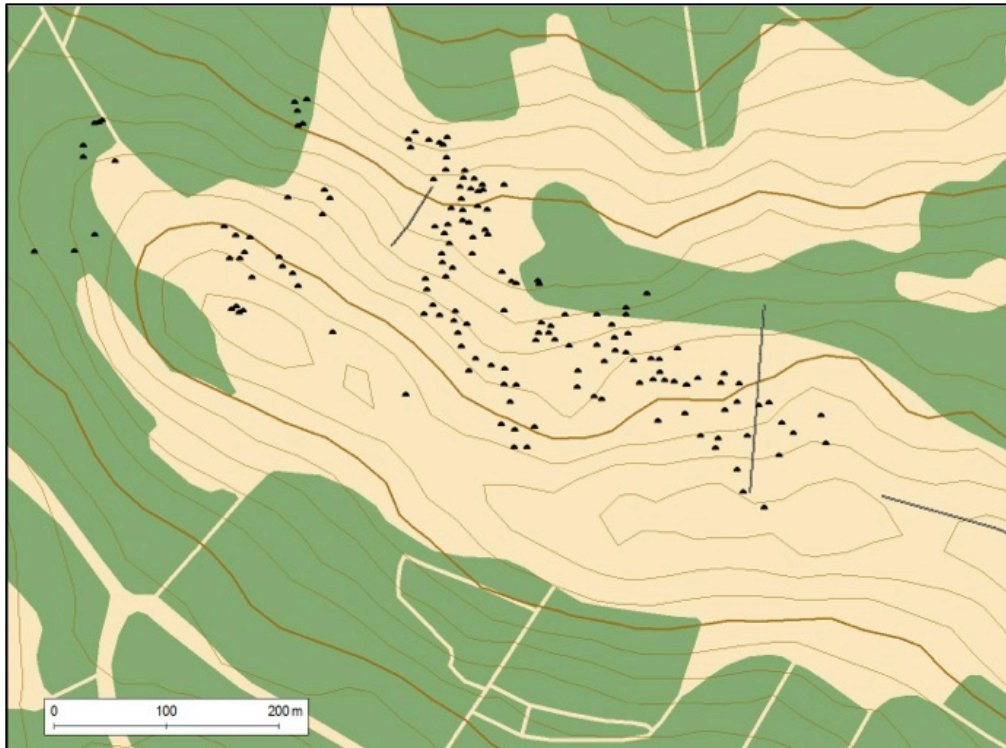


Figure 6.25: Two large cairn fields mapped by the HMTS. Agricultural fields are shown in green. Top: site 16. Bottom: site 53.

The HMTS mapped two large cairn fields at the interface between the agricultural fields and the eastern uplands. The individual cairns are heavily covered with lichen and likely to have remained undisturbed for some time. The cairns averaged two meters in diameter, 0.5 meters in height, and were constructed of piled stones whose surfaces were coated with lichen. Site 16 covered 5.6 hectares and consisted of at least 172 stone cairns in various states of preservation and disturbance, arranged along the northeastern slope of a low ridge (Figure 6.25). The cairns were associated with a set of linear stone alignments, one of which stretched 685 meters long the top of the ridge. The cairn field may have originally been much larger, as modern agricultural fields delimited its edges. These fields may have destroyed or relocated cairns. Site 53 covered at least 11 hectares of the top of a broad plateau (Figure 6.25). The cairns were morphologically similar to those of site 16 in size, volume, and condition.

Other concentrations of cairns apparently not related to field clearance were found across the eastern uplands. These concentrations ranged from 3-5 cairns arranged linearly on the upland slopes to more expansive fields of cairns along the plateau tops or on the small, relatively flat terraces adjacent to some of the larger seasonal drainage systems. Without associated artifacts, the dating of these features was uncertain. The stone surfaces of most cairns in the eastern part of the survey area were covered with lichen in an interlocked pattern, indicating that these cairns had remained undisturbed for some period of time.

In other areas of the Near East, large cairn fields have been interpreted as graves or ceremonial markers, and thus as monumental landscapes associated with pastoral nomadism. Excavations would be necessary to evaluate the validity of a “grave” hypothesis. The excavation of similar cairns in the Negev and Mongolia found that few contained human remains (Haiman 1992; Wright 2007). The HMTS team was permitted to dismantle one cairn, and no obvious indications of a burial existed on the surface under the stones. A burial hypothesis is impossible to validate without excavation. However, these features might instead or in addition have been related to pasture improvement. The clearing of stones into piles could improve the growth of

natural pasture grasses. Ethnographically, nomads are known to have improved pasture via clearance of stones into similar cairns (Chang and Koster 1986: 112-113).

Shooting blinds

Survey on ridgetops in both the western and eastern portions of HMTS found stone structures interpreted as shooting blinds. Most prominent ridges had several of these features, which varied in height, size, and preservation (Figure 6.26). All were constructed of dry stone without the addition of mortar, in a square, half circle, or long “hooked” shape. Most did not have associated surface artifacts.

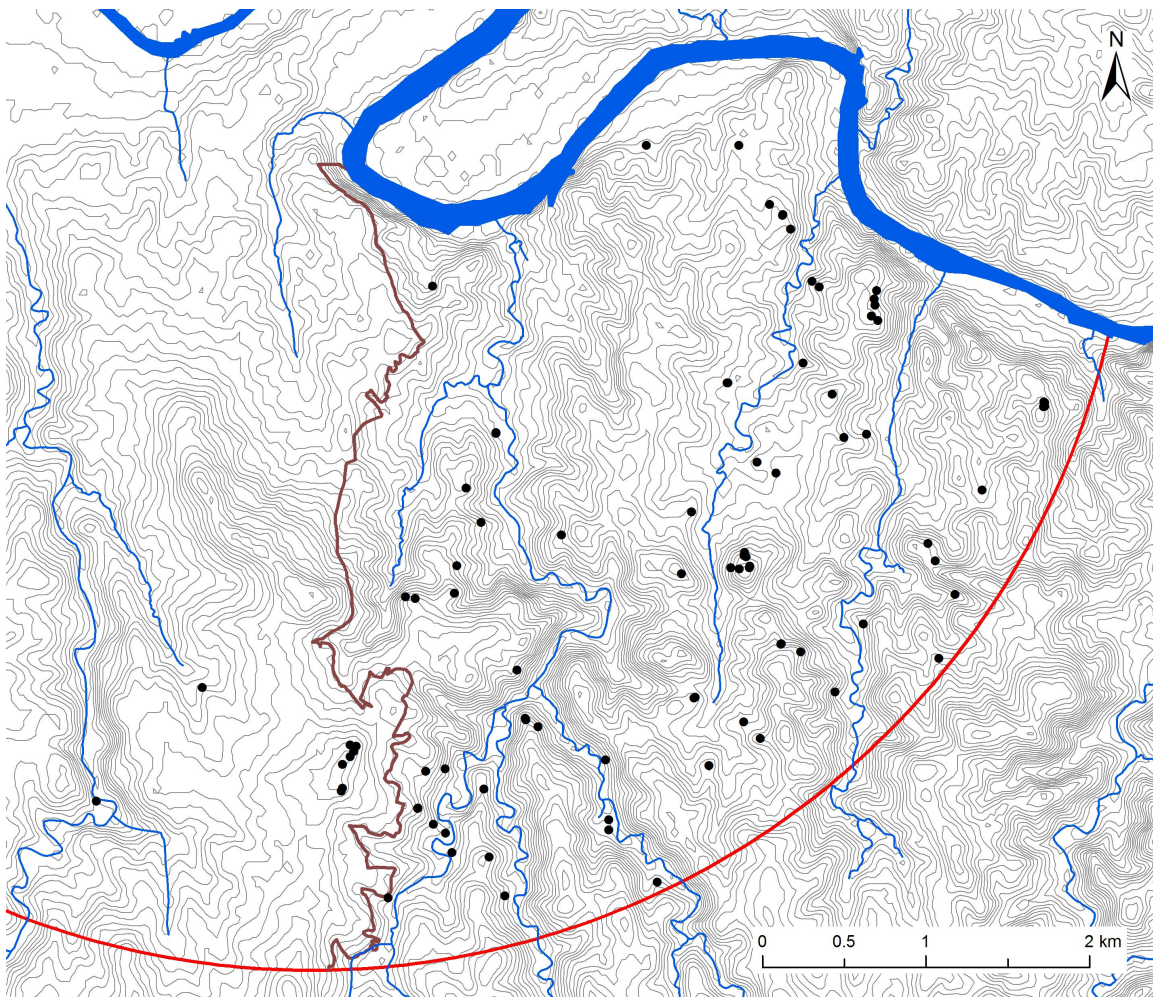


Figure 6.26: Distribution of hunting or shooting blinds identified by the HMTS.

The presence of these features might provide evidence of a long tradition of hunting in the Hirbemerdon Tepe region. Analyses of the Middle Bronze Age faunal assemblage from Hirbemerdon revealed a high percentage of red deer in comparison to surrounding Middle Bronze Age settlements in the Upper Tigris (Laneri, et al. 2008:199-200). The lack of evidence for Bronze and Iron Age settlement in the eastern half of the survey area as well as the general lack of mounded settlement of all periods between Hirbemerdon and Hasankeyf suggests that this area would have generally been open for wild animals such as deer, boars, and foxes. While the lack of a substantial lichen varnish indicates that the standing walls of the shooting blinds are certainly not this old, they could evidence hunting practices in the more recent past. Farmers today pursue packs of wild boars with shotguns in order to keep them out of their vegetable gardens and agricultural fields.

However, the presence of many of these shooting blinds mostly likely has a quite recent explanation related to the Turkish-Kurdish conflict in the 1980s and 1990s. The eastern part of the Upper Tigris River Valley was one of many areas of the countryside evacuated by the Turkish military in the mid-1990s, and Kurdish guerillas frequently hid in difficult-to-access areas such as the eastern uplands between Hirbemerdon and Hasankeyf. A number of hunting blinds were associated with modern litter such as tin cans and gun shells that clearly connect them to the period of Turkish-Kurdish conflict and subsequent military activity in the area.

Caves and Rockshelters

Historically and archaeologically, four periods of intensive use of limestone cave structures have been documented in the eastern Upper Tigris Region: the Paleolithic (Algaze, et al. 1991; Taşkıran and Kartal 2004), the Hellenistic (Barın, et al. 2003), and the Medieval Islamic (Sinclair 1989) periods, as well as the twentieth-twenty-first century. Many of the natural caves and rockshelters in the eastern uplands probably have occupation histories stretching back to the Paleolithic. Scatters of lithic tools and debitage and the substantial talus slopes of these caves

suggested a deep history. The HMTS and previous archaeological survey teams found Paleolithic stone tools, including Acheulian handaxes, on the highest Tigris terraces and on the Ramandağ on the opposite side of the river (Algaze, et al. 1991; Taşkıran and Kartal 2004). However in most cases, the surface artifacts and internal surface features of the caves related to much later periods of use. In particular the recent use of many caves and rockshelters as animal pens resulted in so much dung deposition that earlier occupation surfaces and artifacts were completely obscured from view.

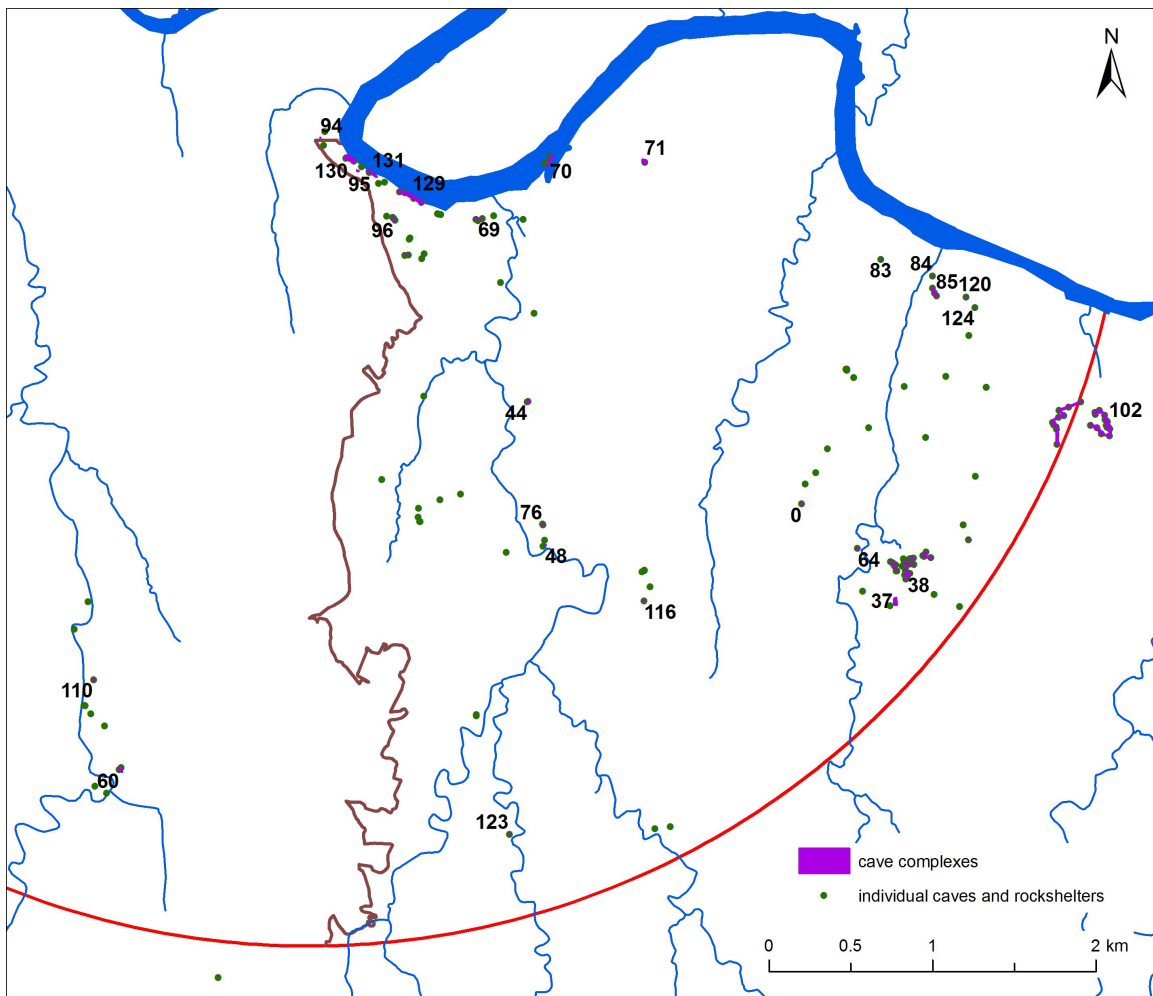


Figure 6.27: Distribution of caves and rockshelters identified by the HMTS.



Figure 6.28: Cave houses and cave pens at campsite 37-38. Top: Square entranceways of the houses and pens cut into bedrock (site 38). Bottom: Cave/rockshelter pen (site 37).

Caves and rockshelters have been described among several of the complexes of features and sites discussed above, including tombs, campsites, and abandoned villages, but also occurred in isolation. Cave tombs located along the Tigris and possibly of Hellenistic date were also described above.

Carved cave structures and natural rockshelters were frequently found in association with campsites. Almost all easily accessible caves and rockshelters showed evidence for recent use as animal pens: stone fences blocked their doorways, their floors were covered by thick dung layers, and feeding troughs have been carved into the walls (Figure 6.28). In several cases, it was clear that caves and rockshelters were focal points for re-occupation. The presence of Medieval Islamic and Ottoman period pottery overlain by twentieth century campsites at sites 38 and 96 suggested that the extensive complexes of caves at these locations were constructed up to 500 years ago and perhaps encouraged centuries of later inhabitation. The ceilings of the caves at these sites had substantial accumulations of black residue from fires, and their floors and talus slopes had substantial accumulations of archaeological sediment. For pastoralists inhabiting the area during the winter, a campsite with ready access to caves for keeping animals warm and safe during foul weather would have a clear advantage. Other campsites such as 44, 65, 72, and 104 were constructed in the vicinity of a single cave of limited size, which could have been used to house young, sick, or otherwise vulnerable animals.

Sedentary villages also incorporated cave structures. At the recently abandoned village of Otlu, houses were frequently constructed against exposed limestone slopes into which (usually single) cave rooms had been carved. Additional multi-roomed cave structures and a large rockshelter located near the houses had been used as animal pens.

Other caves and rockshelters were isolated from surrounding sites. Virtually all of these caves and rockshelters, unless their entrances were extremely difficult to access, contained sheep and goat dung evidencing their use as animal shelters. However, few of these isolated caves and rockshelters had been modified through the construction of stone walls or through the carving of

feeding troughs. One exception is a large rockshelter located along the Tigris at site 124. While pastoralists certainly used these isolated caves and rockshelters, they seem to have primarily invested effort in constructing features within those caves that were located in immediate proximity to their campsites.

Isolated Corrals

In the eastern uplands, eleven isolated stone corrals apparently without associated camping areas were mapped (Figure 6.29). These features were located on the plateaus between seasonal drainage systems and on the relatively flat terraces adjacent to the incised wadis. It is possible that these corrals were originally part of campsites where the associated tents were not pitched on any type of surviving foundation. However, the survey team visited these sites during multiple seasons, under different surface visibility conditions, in order to check for packed earthen tent surfaces. Since no such surfaces were found and since the isolated corrals are frequently on plateaus rather than in the incised drainage systems where all of the identifiable campsites are located, these corrals might represent sites where animals were penned when they did not need to be returned to the campsite for the night, perhaps while under the care of a single shepherd sleeping in the open air. Isolated corrals could have also been constructed and/or used by village-based herders who brought their animals to pasture in the eastern upland area away from the settlement and the agricultural fields.

The chronology of these isolated corrals is unclear, but they all have a similar form (Figure 6.30). The survey team found no surface artifacts in association with the features, but the stone walls were heavily collapsed and the vegetation and soils in the interiors of these enclosures did not differ visibly from the surrounding terrain, which suggested that they have long been out of use. The corrals had a rounded shape, were up to 20-25 meters in diameter, and frequently were constructed in pairs, with two adjacent enclosures sharing one of their sides.

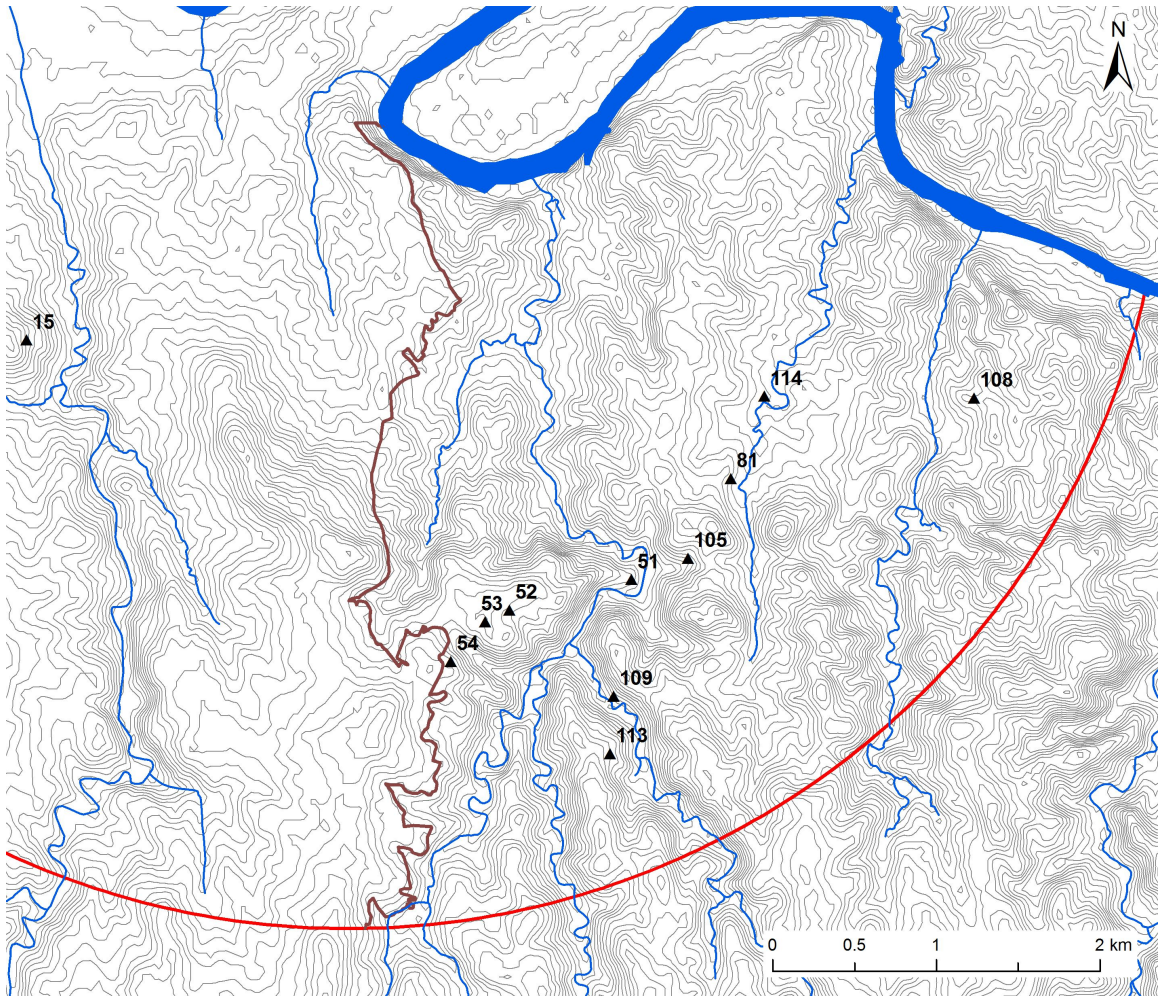


Figure 6.29: Distribution of isolated stone corrals identified by the HMTS.



Figure 6.30: Double isolated stone corral.

Natural Pens

In addition to constructed penning places within carved caves and stone corrals, the landscape provides natural pen sites: areas where small side valleys and eroded bedrock form natural enclosures and protective rockshelters (Figure 6.31). While recently-used areas were recognizable from thick dung deposits, such features will typically not leave lasting archaeological evidence. Several ideal locations for natural penning areas, such as the west end of site 17 and site 105, were identified during the course of survey. The surfaces of some of these areas had recent sheep dung, but there were no visible surface traces of earlier periods of use.



Figure 6.31: Natural pen area in a side valley within the HMTS.

Cisterns

Twenty-nine cisterns of two types were carved into exposed limestone bedrock on hillsides (Figure 6.32). “Pit-style” cisterns consisted simply of reservoirs carved into horizontal bedrock surfaces (Figure 6.33). The interior of these cisterns was frequently bell-shaped, with the base of the reservoir wider than the top. “Stepped cisterns” consisted of roughly rectangular tanks with rectangular doorways carved into exposed limestone slopes (Figures 6.33, 6.34). Sets of 3-5 stairs led from the exterior to the bottom of the tank, and shallow channels were often carved into the surrounding exposed bedrock for the purposes of directing surface runoff into the tank. Individual steps typically were 0.5-1 X 0.2 meters in surface area and each ca. 0.3 deep. Tanks varied in size from ca. 6-16 cubic meters in volume. The associated shallow surface channels of one cistern could be followed for at least 30 meters across the bedrock surface. Chisel marks on the ceilings, walls, and sides of the cistern tanks indicated that they were hand-carved.

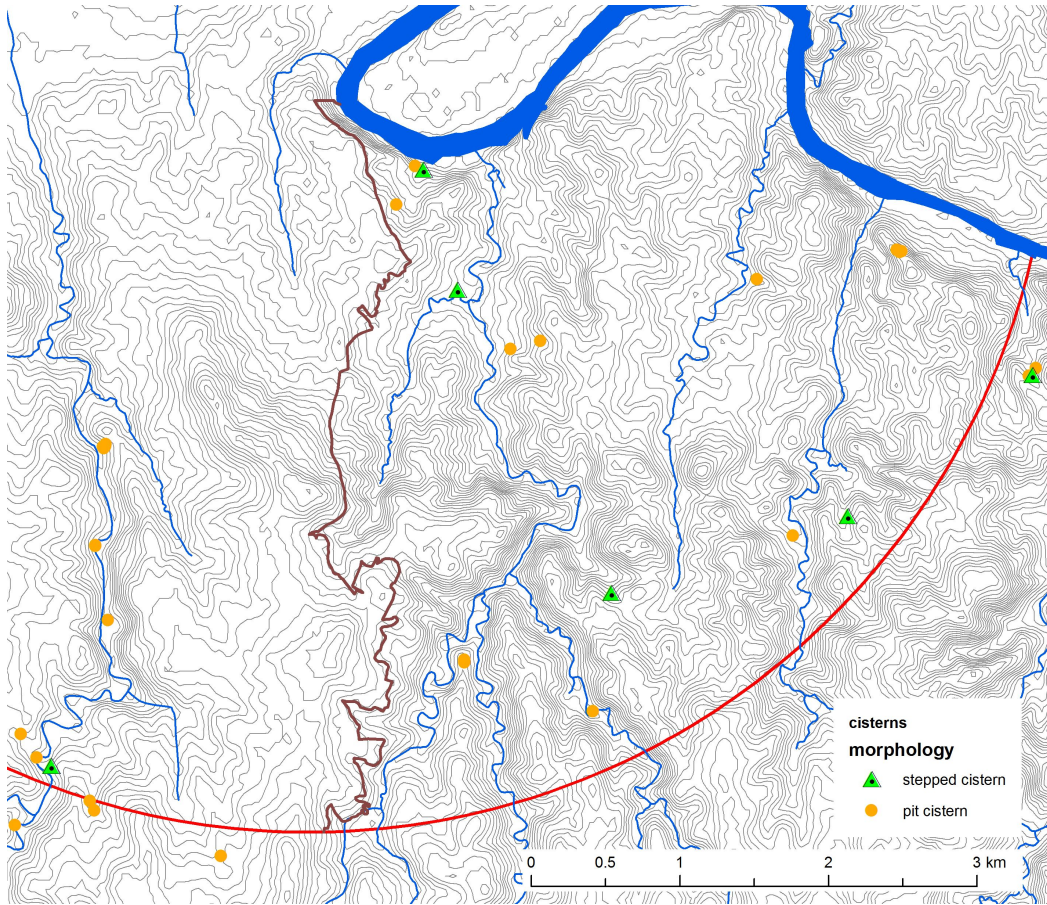


Figure 6.32: Distribution of cisterns identified by the HMTS.

Many of the cisterns had patches of cement mortar on their interior surfaces (especially the surfaces of stairs), indicating use in modern times. However, the amount of silt in many other cistern tanks and wear on the steps indicated that most cisterns had not been recently maintained. The interiors of all but a few of the pit and stepped cisterns were filled with substantial amounts of fine sediment and sometimes also modern garbage, both of which would pollute the water and make it unfit for human or animal consumption. The sediment mounds and artificially built-up slopes outside of the stepped cisterns evidenced earlier cleaning episodes.

The majority of the cisterns were located in the eastern portion of the survey area. Ten cisterns were located at the modern interface between agricultural and pastoral land-use. The concentration of cisterns in the eastern uplands is related to environment and land-use patterns.

Exposed bedrock areas of substantial size, ideal for cistern construction and the collection of runoff, are a primary characteristic of the eastern uplands. The concentration of cisterns in the eastern uplands probably also is related to patterns of pastoral land-use.

Ethnographies of pastoralists in Iran and Turkey demonstrate that transhumant communities constructed dams, basins, wells, and cisterns in their seasonal territories (e.g., Beck 1991; Skogseid 1993; Tapper 1979c). While some cisterns contained residual water during the summer months when they were mapped by the HMTS team, many would only be functional during the winter rainy season, and all would have only been actively refilled with water during the winter and spring. These are also the seasons during which pastoralists camped in this region. Ethnographic analogy, spatial association, and this seasonality element suggested that cisterns were created and used by the inhabitants of campsites. Future research will investigate whether campsites and cisterns chronologically overlap via radiometric dating methods.

Four cisterns were located within campsites (sites 37, 44/45, 65, and 96). Though material evidence directly linking many of the other water collection features (cisterns, dams, and wadi collection features) to campsites is lacking, there are several reasons to associate these features with pastoral nomadic land-use. The only sedentary sites in the eastern upland area are located along the Tigris and would have relied on river water. Sedentary sites should be associated with perennial subsurface water constructions. As was already pointed out above, surface runoff is only present during the winter rains, in the season that pastoralists camped in this area. Distance-wise, the closest inhabitation sites to cisterns were almost always campsites, a fact that is investigated more quantitatively in Chapter 7. In the absence of wells and other types of upland settlement away from the river, the surface water features are considered to be associated with pastoral nomadic land use.



Figure 6.33: Cistern morphologies. Top: stepped cistern at site 24. Bottom: pit cistern at site 34.

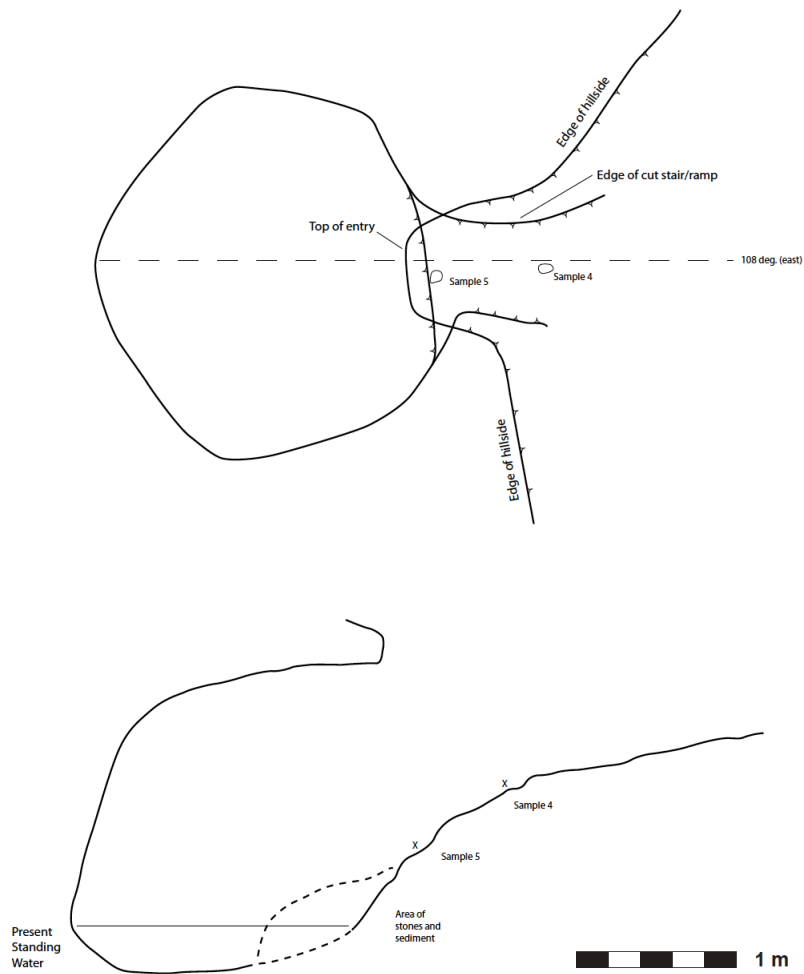


Figure 6.34: Diagram of the interior of the stepped cistern at site 45. Top: overhead view. Bottom: profile view.

Check Dams and Terraces

After cairns, check dams were the second most common landscape feature in the eastern uplands. Many slopes have several check dams constructed of piled stones for the purposes of impounding limited amounts of water and sediment. Check dams frequently occurred in aligned sets, both resembling and functioning like small sets of terraces. Frequently these features were merely a line of stones across small drainages. In other cases, the dams consisted of multiple courses of stones (Figure 6.35).

Check dams probably affected the pastoral landscape in two ways. First, they helped retain soil and moisture on the eroded slopes, improving the growth of natural grasses in their immediate vicinity. Second, small, short-lived pools of water could form behind them after particularly heavy rains and could be used for animal consumption. Both of these benefits were only possible during the winter rainy season, when moisture is present in the ground surface.

Given their small size and placement on slopes that are constantly transformed by alluvial and colluvial processes, it is likely that many of these check dams have been washed out and/or buried in sediment. The surface survey thus has surely greatly underestimated the total number of check dam features. Those that have been mapped are a small and non-representative sample (Figure 6.36).

In one case, at site 133, a more substantial dam was constructed across the main bed of a wadi. This feature was clearly intended to retain larger amounts of water and sediment. A modern dam constructed of cement immediately upstream has superseded the now-collapsing feature at site 133.



Figure 6.35: Check dams in the HMTS area. Top: photograph of a single earthen check dam. Bottom: Google Earth image of sets of stone check dams in the bases of drainages.

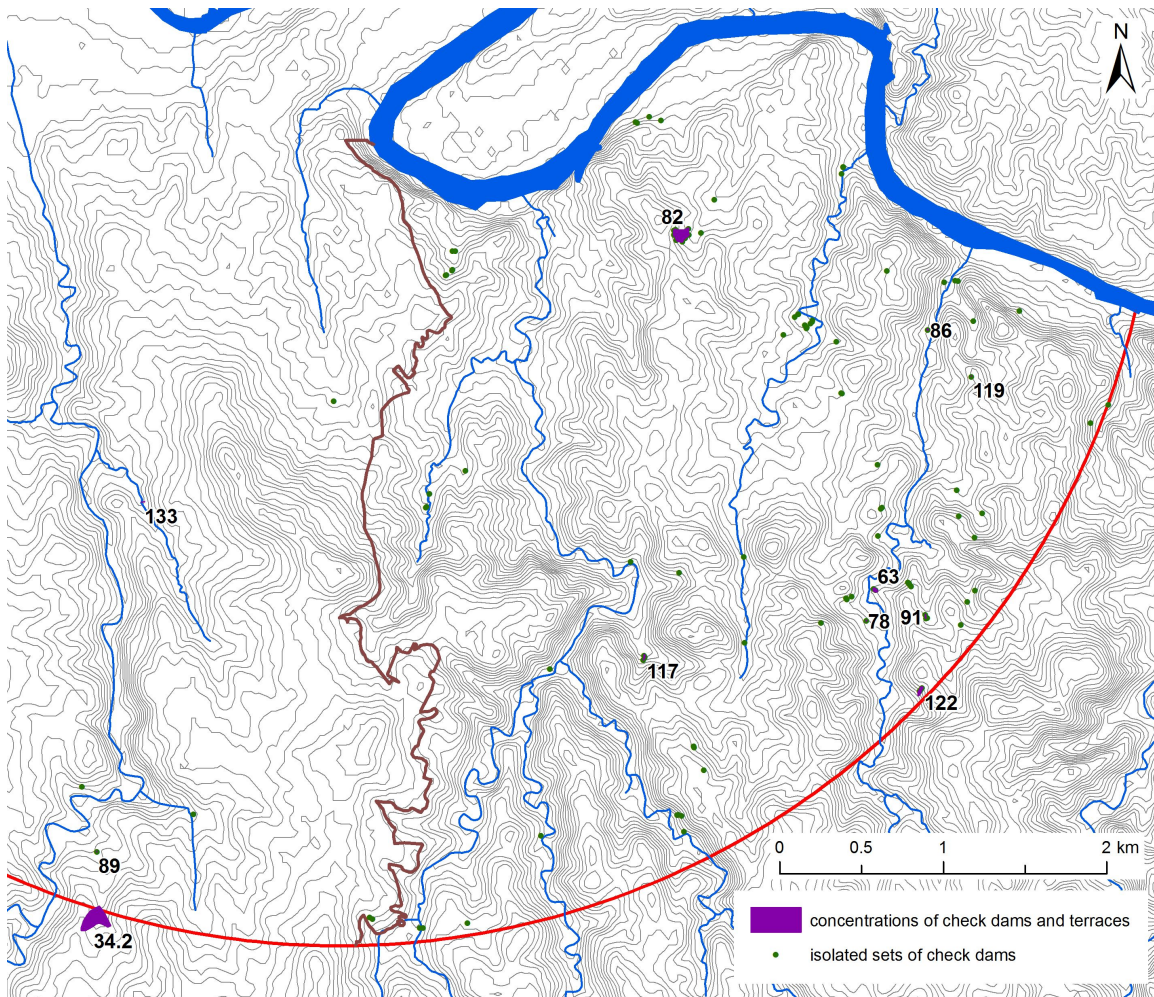


Figure 6.36: Distribution of check dams and terraces identified by the HMTS.

Water Retention Features (?) in Wadis

Six features of an unknown function were constructed of dry stones (Figures 6.37 and 6.38). These features were cylinder shaped with diameters of up to 4 meters and walls up to 1.5 meters high. They were located in the base of wadis. One of these had some stones that were lain on top of nylon sack material, indicating a modern date for this feature. No artifacts or residues indicative of the features' function were found. The survey team's driver, a local villager, said that these were kilns for making charcoal, but the stones and soils in and around these features show no traces of burning. Based on the features' positions in wadi beds, it is assumed that they have something to do with water retention.



Figure 6.37: Water retention feature (?) at site 28.

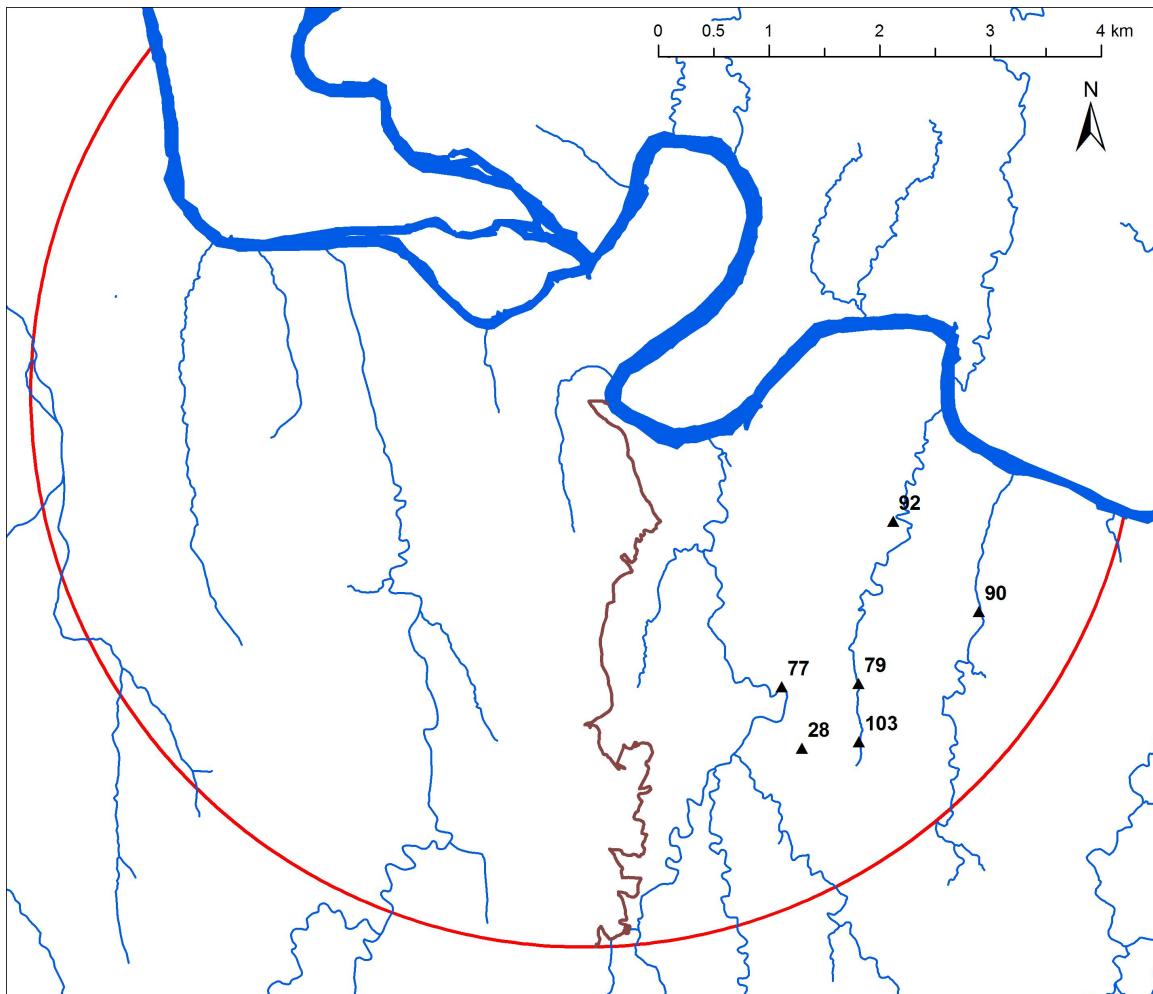


Figure 6.38: Distribution of water retention features in wadis identified by the HMTS.

Sites and Landscape Features in the Surrounding Region Identified via Digital Globe Satellite Imagery

Additional sites and landscape features were identified beyond the boundaries of the survey area using Digital Globe imagery available via Google Earth. The goals of examining this area with satellite imagery were 1) to determine if this land could have been open pastureland in the past, 2) to determine if the types of sites and features and spatial patterning of sites and features seen in the HMTS area were representative of those present in the wider region, 3) to determine if the size of the eastern part of the survey area (ca. 16.5 square kilometers) was sufficient for detecting local land-use patterns. Previous surveys of mounded sites in the Upper Tigris River Plain (Algaze, et al. 1991) provided the regional context for settlement patterns and taphonomic processes at work in the western portion of the HMTS area; the satellite imagery analysis provided a similar regional context for settlement patterns and taphonomic processes in the eastern portion of the HMTS area.

Via the systematic methodologies described in Chapter 2, over 85 sites and features were identified in the area stretching west-east from the Savur Çay, a seasonal tributary of the Tigris, to the Batman-Mardin road, running just east of Hasankeyf and stretching north-south from the plain north of the Tigris river to the northern edge of the Gercüş agricultural plain (Figure 6.39). The terrain of this area is identical to that of the eastern portion of the HMTS area: eroded limestone hills with thin soils cut by deeply incised seasonal drainages. Modern villages are small and further apart than they are on the Upper Tigris Plain, and much of the landscape is open pastureland. The spatial restriction of modern agriculture resulted in a situation where the foundations of ancient structures and landscape traces of pre-modern land-use were highly visible in satellite imagery.

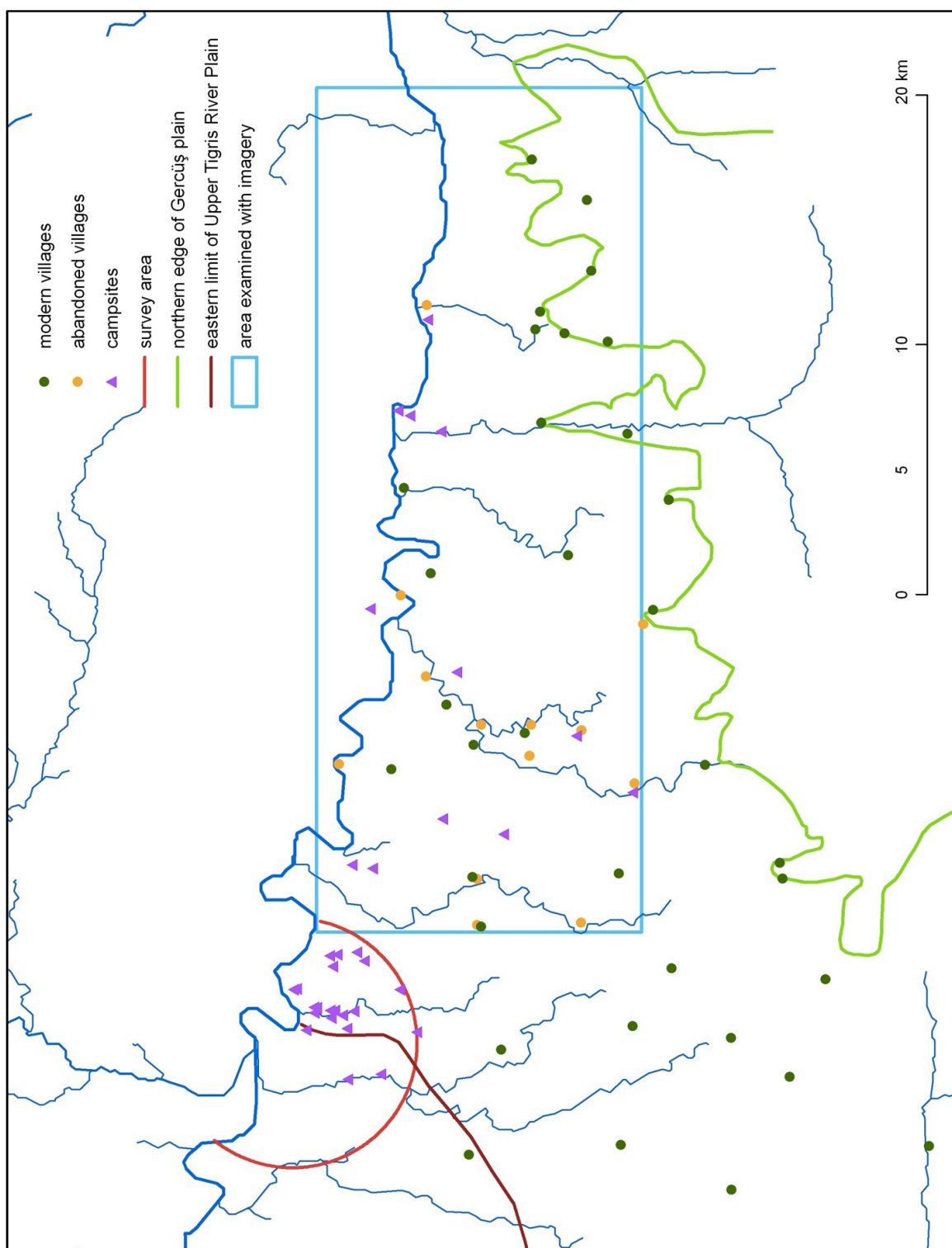


Figure 6.39: Sites and features identified via Google Earth imagery in the area to the east of the HMTS.

Of the 12 classes of archaeological sites and features recovered by the HMTS, 6 were visible in the satellite imagery: abandoned villages, campsites, isolated corrals, cairn fields, shooting blinds, and terraces and check dams. Additionally, modern villages and field systems were visible. Unmounded sites, caves and rockshelters, cisterns, cemeteries, and water retention features in wadis likely would never be readily visible in even very high-resolution satellite imagery. Cisterns, caves, and rockshelters are usually best recognized from a horizontal perspective, unmounded sites are only recognizable via intensive fieldwalking, the burials in cemeteries are frequently marked by faint stone circles that may be difficult to distinguish in the imagery, and the water retention features are too small to be seen in the imagery. One other class of site, mounded settlements, was visible in satellite imagery of the HMTS area, but was either indistinguishable or absent in the satellite imagery of areas to the east. Low mounded sites typically are not highly visible in Digital Globe imagery because the images are frequently acquired close to noon in the summer months. The resulting lack of shadow is excellent for a clear picture, but makes topography difficult to distinguish from the image. It is possible that low-mounded archaeological sites exist underneath modern villages and the ruins of abandoned villages to the east of the HMTS but the characteristics of the satellite images and the foundations of the structures making up these village sites obscured the mounds.

While the satellite imagery allowed the identification of numerous additional sites, it cannot replicate the full results of an intensive pedestrian survey such as the HMTS. Within the various classes of sites and features in the imagery, it is highly likely that only the most highly visible examples of these sites and features are identifiable. For example, only those campsites and abandoned villages that had traces of standing architecture could be recognized in the imagery. Campsites consisting only of earthen tent surfaces and long-abandoned villages without surface traces of stone walls were missed. Without the opportunity to inspect the surface artifacts and soil conditions at a site or feature, it was difficult to hypothesize a date for these sites and features, and it was also difficult to distinguish between different classes of features. For

example, the frequent inability to detect dung surfaces from the satellite imagery made it impossible to distinguish between stone enclosures used as corrals and stone enclosures used as tent footings with some campsites. Finally, it was only through the experience of conducting the survey (“ground truthing”) that it became possible to identify and properly interpret the sites in the broader region that were only accessible for study through satellite imagery.

There was large area of approximately 70 square kilometers in the center of the area studied via satellite imagery that appeared to be devoid of surface indications of archaeological sites or landscape features. This area extended from campsite 244 eastward to Hasankeyf. The only sites in this area were immediately adjacent to the Tigris or on the northern fringes of the Gercüş Plain. One of the sites along the Tigris has been tentatively identified as the Roman fort Rhipalthas (Comfort 2009: 26, 61, 326). There is no obvious environmental explanation for this “empty area,” and it could be that archaeological sites and features would be visible in a surface survey.

Inhabitation Sites and Landscape Features

Modern Villages and Field Systems (Cairn Fields, Terraces, and Check Dams)

Modern agricultural villages and their associated field systems were the most highly visible features in the satellite imagery. Clearance cairns, stone alignments bordering fields, terraces, check dams, plow lines, and vegetation patterns marked these field systems and allowed their identification in the satellite imagery. The villages were small, none larger or denser than the villages of the Hirbemerdon Tepe area. Modern villages were located either on slopes beside wadis, on ridges overlooking wadis, or plateaus between wadi systems. Regardless of their location, agricultural fields always surrounded them. These fields were spread across nearby plateaus, extended along the bases of nearby drainages, and/or were arranged on nearby terraced slopes.

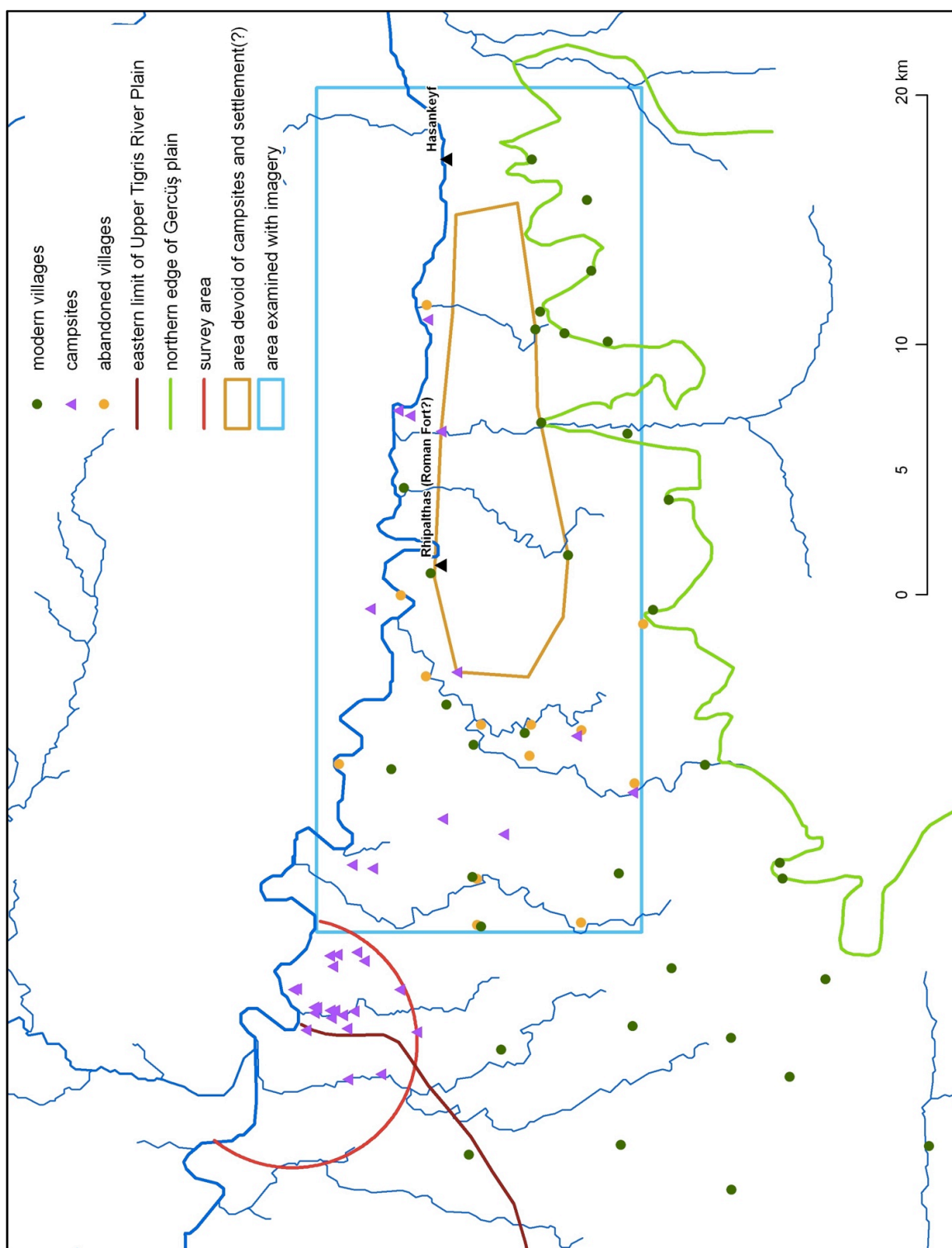


Figure 6.40: Area without evidence for inhabitation or landscape modification in the satellite imagery to the east of the HMTS.

One of the most useful aspects of the satellite imagery analysis was that it provided examples of intact, in-use field systems that were useful for the interpretation of the archaeological features surveyed in the HMTS. The function of check dams and their hypothesized purpose for either an agricultural or a pastoral land-use system were discussed above. In the context of the modern field patterns to the east of the HMTS, it was apparent that these features were frequently created for agricultural purposes. Sets of check dams characterized the agricultural fields laid out in the bases of small, incised drainages. Here, they seem to encouraged the accumulation of soil and moisture occurring naturally through alluvial and colluvial processes. These dams sometimes occurred as sets of straight lines and other times as sets of curved semicircles.

Unlike on the river terraces, the field systems associated with villages in the upland area were in many cases spatially distinct from one another. In the Upper Tigris River Valley cultivated and fallow fields covered the land almost continually, and it was difficult if not impossible to tell where the boundaries of a given village's fields lay without asking local inhabitants. However, in the uplands, the field systems surrounding many villages were separated from the field systems surrounding other villages by tracts of apparently uncultivated land. Further, many of the field systems were based on the cultivation of wadi bottoms lined with check dams, resulting in a pattern of isolated fields surrounded by uncultivated slopes and ridges. The size of the "halo" of fields surrounding upland settlements varied widely based not only on the size of the village, but also based on the topographic characteristics of the surrounding area, in particular whether continuous (terraced or flat) or discontinuous (wadi-bottom) fields were present. The fields nearest to the inhabited villages naturally showed evidence for current or recent cultivation. However, the edges of these cultivated areas typically had check dams, clearance cairns, and stone alignments marking fields that are not currently in use.

Abandoned Villages and Relict Field Systems (Cairn Fields, Terraces, and Check Dams)

Abandoned villages were visible from the partially collapsed stone foundations of structures. These stone foundations were distinguished from those of campsites and corrals on the basis of their layout. Stone foundations forming a cellular pattern and arranged in dense clusters were interpreted as the remains of abandoned villages. Relict agricultural fields were recognizable through the presence of check dams, terraces, cairns, linear stone features, and vegetation and soil marks in areas that are not presently cultivated. Both sets of features were identified as abandoned on the basis of a lack of roofs, the presence of stone collapse, and the unplowed and overgrown nature of fields. However, it is impossible to say how long they have been abandoned. Some abandoned villages appear to have been inhabited in the late 1960s at the time of CORONA satellite photographs. The Turkish-Kurdish conflict of the 1990s resulted in the evacuation of the countryside. When the countryside was repopulated in the late 1990s, there was a documented drop in the number of villages (Jongerden 2007) and presumably also the amount of cultivated land, particularly in “marginal” areas such as the area between Hirbemerdon and Hasankeyf that were further from established gendarme posts. The preservation of several village layouts resembles the partially collapsed state of the village of Otlu in the HMTS area, and it seems reasonable to assume that these villages have been abandoned for approximately sixteen years now. Frequently abandoned villages were located only a short distance from a modern village; perhaps the modern village in these cases represents a refounding of the village after the conflict. Other villages, however, were clearly in a much greater state of collapse and have been abandoned for far longer.

Both modern and abandoned villages were mostly located on hilltops or on wadi terraces. Some the village layouts were dispersed, but most were densely constructed. Overall, modern and pre-modern agriculture are largely confined to major wadis and broad, flat plateaus typically near the Tigris River. The modern and abandoned villages clearly clustered along the major seasonal drainages. However, the field systems also made extensive use of minor, tributary wadi

bottoms, using the naturally moister vegetation, accumulated soils, and check dams to enhance crop growth.

Relict terraces and check dams were often more readily indicated in the imagery by the alignments of more lush vegetation, including shrubs and trees surrounding them, than by the rock constructions themselves. Some of the most substantial of the abandoned terrace and check dam systems were visible in CORONA satellite images of the 1960s.

Some of the names of the modern villages in this area are suggestive of seasonal inhabitation, including “Kışlak” (winter place), “Yaylayanı” (summer place/area), and “Yayladüzü” (summer plain). The association of most villages with agricultural fields suggests spring and summer use.

Campsites and Isolated Corrals

Sites labeled "campsites" and "isolated corrals" in the satellite imagery were characterized by rectangular, free-standing stone enclosures. Most of these enclosures are likely to have served as corrals on the basis of their size and interior soil discoloration. Their size was similar to that of the structures identified as corrals in the HMTS area. The soil discoloration, which typically fanned out from the doorway of the structures, probably resulted from both dung deposition and the trampling of animal hooves. Although the stone walls of enclosures were the most visible features of these sites, some other more ephemeral features were visible on the basis of soil discoloration alone or on the basis of faint, partial stone alignments. Frequently the stone alignments were most readily recognizable on the upslope side of the rectangle. Both of these characteristics might indicate the locations of corrals and other enclosures that were primarily constructed of perishable materials.

The interpretation of 13 sites from the satellite imagery specifically as campsites (rather than isolated corrals, corral groups, or foundations of permanent structures) is conjectural (Figures 6.41, 6.42, and 6.43). Typically the HMTS distinguished between corrals, structure



Figure 6.41: Comparison of the size and layout of campsites 200, 201, 241, and 254, identified using Google Earth satellite imagery.

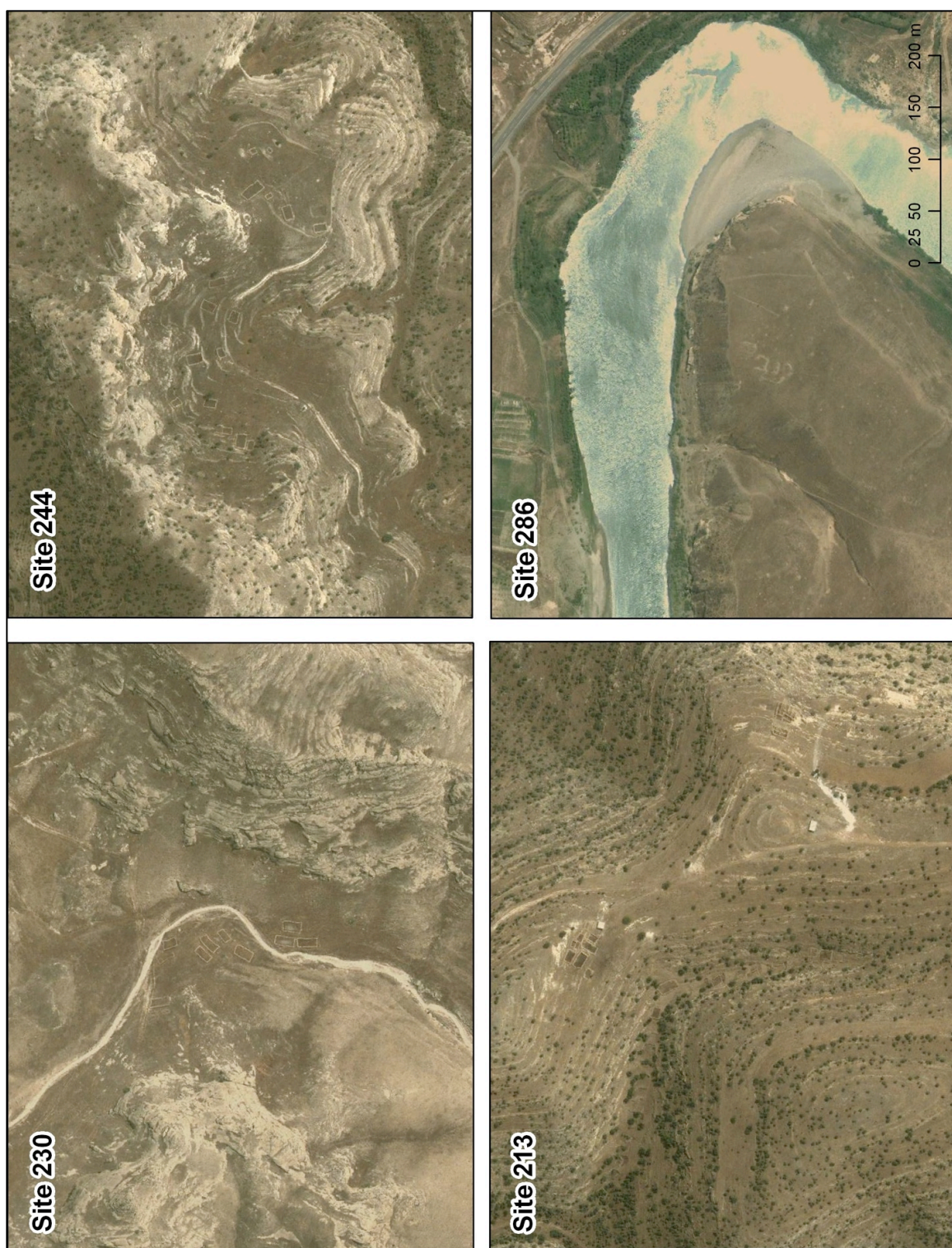


Figure 6.42: Comparison of the size and layout of campsites 230, 244, 213, and 286, identified using Google Earth satellite imagery.



Figure 6.43: Comparison of the size and layout of campsites 240, 222, and 224, identified using Google Earth satellite imagery.

foundations, and tent foundations on the basis of dung layers and artifact scatters that were not visible in the imagery. Villages were distinguished from campsites in the HMTS area on the basis of the villages' more cellular, dense layouts, but isolated structure foundations were difficult to distinguish from isolated corrals on the basis of satellite imagery alone. Campsites were distinguished from isolated corrals in the HMTS area on the basis of evidence for adjacent inhabitation in the form of a tent foundation or earthen tent surface. Tent surfaces were generally not visible in the satellite imagery, and except in a few cases where soil discoloration possibly resulting from dung existed, there was no sure way to distinguish between stone tent foundations and other types of stone foundations and enclosures such as abandoned structures and enclosures based on the imagery alone. Without solid evidence for the presence of tent foundations or tent surfaces, it was impossible to tell if the sites seen in the satellite imagery were actually campsites as opposed to groups of corrals perhaps constructed by the inhabitants of nearby villages for use by village-based herds. However, within the HMTS area, sites with more than two stone enclosures typically had associated tent surfaces, and tent foundations typically were significantly smaller than corrals. Additionally, the modern villages in the area examined typically incorporated animal enclosures in their layouts. On these bases, complexes with more than two separate stone enclosures seen in the satellite imagery are argued to represent campsites used by transhumant pastoralists. Many of these campsites seen in the satellite imagery had a number of smaller enclosures that could have either served as small corrals or as tent foundations.

Without the opportunity to examine the surface artifacts of these campsites, it is impossible to know their chronology. However, the fact that only campsites with stone corrals were visible in the satellite imagery suggests that the imagery only allows us to investigate the most recent of these campsites, possibly only those of the twentieth and twenty-first century. The campsites with significant soil discoloration and structures possibly constructed of organic materials are like to be quite recent. Other sites entirely consisted of structures that were more faint and degraded, and therefore might be older. Some campsites had both highly visible, well

preserved stone enclosures and more degraded enclosures, suggesting either different periods of use, different construction phases, or different construction methods.

The relatively low density of campsites in the broader region (13 in 440 square kilometers versus 18 in 47 square kilometers of the HMTS area) is likely to be a result of the fact that only the most highly visible campsites were visible in the imagery. If we consider the density of highly visible modern and twentieth century campsites identified by the HMTS in comparison to the results from the broader region (6 campsites in 47 square kilometers versus 13 campsites in 440 square kilometers), the figures are slightly more comparable. Thus, the relatively low density of identified campsites to the east of the HMTS is probably not reflective groups' preference for one area over another.

Campsites clustered on terraces adjacent to the Tigris, and their density appeared to decay with distance from the river. Away from the river, campsites were most frequently found on wadi terraces, where they were protected by limestone outcrops. One exception was located on a plateau between two wadi systems. Campsites away from the river are found along minor drainage systems. They were thus for the most part are not located in proximity to the modern and abandoned villages, although three campsites were located beside abandoned villages. However, campsites were frequently located in proximity to abandoned field systems marked by check dams. The majority of the campsites were found in the area that is least accessible by the modern roads connecting agricultural settlements at Hasankeyf and in the Gercüş Plain.

The layout of campsite structures often conformed to the outline of nearby fields. There are two possible explanations for this situation. First, pastoral nomads could have constructed their corrals at the edge of fields in order to take advantage of crop stubble in the fall. Second, the fields could have been shaped around the campsites or even potentially have dismantled part of the campsites. Either is possible, particularly in an area such as this where the location of agricultural fields frequently shifts, and a combination of these explanations could be true for any given campsite. In the HMTS area, the second situation explained the current location of site 18

along the irregular edges of a field (Figure 3.4). In 2007 and 2008, this campsite was located on the uncultivated terraces of a wadi. In 2009, however, a highly irregularly shaped field had been plowed and sown with wheat on the terrace on the east side of this wadi. The edges of this field wove carefully between and along the walls of the stone enclosures of the campsite. The amount of agricultural land in the eastern uplands is limited, but even in modern times this limited land has not been fully planted. It was probably not worth the farmers' efforts to dismantle the structures of the campsite--they could simply extend the field in a different direction. Alternatively or in addition, the farmers may have avoided dismantling or disturbing the campsite structures in the interest of conserving the landscape investments of pastoral nomadic groups.

Shooting or Hunting Blinds

All of the shooting blinds seen in the satellite imagery were located on one hilltop. Their relatively clear signature in the imagery and their arrangement around the edges of the hilltop indicated that this was a relatively recent army camp. Older, more collapsed shooting or hunting blinds were probably not visible in the satellite imagery.

Area Empty of Satellite Imagery Signatures of Inhabitation and Landscape Modification

From visual inspection of the distribution of all types of sites and features identified using satellite imagery in the area to the east of the HMTS, it was clear that a fairly substantial area adjacent to the Tigris River is apparently empty of agricultural or pastoral inhabitation (Figure 6.40). This area was inspected on the satellite imagery a second time, in order to ensure that evidence of inhabitation or landscape modification was not missed. However, no traces of either sites or features were found.

The presence of this area suggests an important conclusion about pastoral inhabitation in the eastern uplands. This “empty area” could be merely a result of the lack of “ground truthing.” If, however, this empty area really was not used for agricultural or pastoral inhabitation, then its presence shows that pastoral nomads were not forced to camp in just any open area within the

upland landscape, that they were able to choose not to inhabit this space. Further, the mutual agriculturalist-pastoralist avoidance of this area would suggest that agricultural and pastoral land-use patterns were not complementary; rather the two land-use systems were to a certain degree in competition with one another for land.

Conclusion

The Hirbemerdon Tepe Survey mapped twelve different classes of archaeological sites and landscape features that evidence agricultural and pastoral land-use from the Neolithic Period to the twenty-first century. The dating of many sites and landscape features was difficult or impossible within the scope of the survey permit. The analysis in the following chapter will focus on evidence for pastoral nomad inhabitation and activities. However, patterns of agricultural settlement and field systems have been described in order to reconstruct the general land-use systems of the Hirbemerdon Tepe and broader eastern upper Tigris area. These general patterns are important for understanding the context in which pastoral nomadism occurred and for hypothesizing which areas would have been available for open pastureland.

Sites most clearly related to pastoral nomadism were mapped in the eastern, upland portion of the survey area. Three taphonomic classes were defined and argued to represent modern, twentieth century, and pre-twentieth century campsites. Well-preserved modern and twentieth century campsites were used to help interpret the more fragmentary remains of older campsites. The campsites were located on river and wadi terraces, appear to have accommodated small numbers of households, and showed a variety of layouts. Landscape features designed to pen animals and to improve water and pasture resources in the area surrounded campsites in the eastern uplands. In the western portion of the survey area, the sherd scatters mapped by the survey could represent a variety of short-term or non-intensive occupation, including campsites of pastoral nomads.

Satellite imagery analysis of a large area to the east of the Hirbemerdon Tepe Survey provided regional context for the small study area. Six of the twelve classes of surveyed sites were identifiable in the imagery. Only the most highly visible (and probably the most recent) sites were visible. However, the imagery clearly showed that agricultural activity has been spatially discontinuous throughout the eastern uplands, leaving tracts of land open for pasture. Furthermore, the results from the imagery analysis suggests that the patterns seen in the Hirbemerdon Tepe Survey are representative of the broader upland region to the east of the Upper Tigris River Plain. Both modern and abandoned villages clearly clustered in the vicinity of the major seasonal drainages. Campsites were arranged on river and minor wadi terraces and tended not to be located in the vicinity of modern or abandoned sedentary villages. The first two spatial patterns were readily apparent from the area covered by the Hirbemerdon team, but the third pattern required analysis of a larger area to verify.

Comparison of modern agricultural patterns visible in the satellite imagery to archaeological features in the Hirbemerdon survey area suggests that many of the landscape features visible in the survey, in particular check dams and cairns, may have been constructed for either agricultural or pastoral land use. Other features mapped by the survey team were probably created or transformed by pastoralists. In particular, cisterns may have been constructed by pastoralists to collect surface runoff during the winter rainy season and caves may have been constructed or modified by pastoralists to house their animals during inclement weather.

The eastern area is a marginal, upland region, but it is still in many ways an agricultural landscape. How did pastoralists benefit from this? Features such as check dams and terraces had the dual function of improving crops and natural vegetation/pasture. Even if constructed for agricultural purposes, these features continued to accumulate soil and moisture after they went out of agricultural use, improving the naturally occurring vegetation in their immediate vicinity. After agricultural abandonment, these features continued to function in a way that improved the pastoral resources of the region and encouraged repeated pastoral reinhabitation of the area.

Surveyed Features of the Eastern Uplands as Landscape Anchors

The features surveyed by the HMTS represent landscape anchors. In Chapters 1 and 2, the term “landscape anchor” was employed to describe pastoral landscape features that are physically and spatially fixed investments in the productivity of the landscape. Such features will also have evidence for maintenance and re-use, and will play a long-term role in structuring local settlement and land-use.

Many features in the eastern uplands described in this chapter fulfill the “fixed investment” aspects of the landscape anchor definition. Pastoral nomadic groups migrated seasonally, kept their capital wealth in a mobile form (animal herds), and had a highly transportable material culture, for example in the form of goat-hair tents and animal skin bags. However, these groups also invested in spatially fixed landscape features to improve herding resources surrounding their campsites. Cave pens, corrals, and tent foundations were fixed investments designed to protect humans and animals. Cisterns spatially and temporally diversified the available water sources for human consumption following the winter rains. Dams and cairn fields helped intensify the growth of uncultivated pasture grasses by increasing soil humidity and soil accumulation and by reducing the number of stones in the soil.

Some classes of surveyed features also fulfill the “re-use and maintenance” aspects of the landscape anchor definition. Cisterns and caves have particularly clear evidence for long-term use and maintenance. The openings of many cisterns are marked by mounded soil heaps (Figure 6.44). These heaps result from cleaning out the silt and debris that inevitably accumulated in the cistern along with surface water runoff. The talus slopes outside of cave entrances similarly indicated repeated cleaning of such features. Excavation of spoil heaps and talus slopes was not permitted, but their very presence indicates extended use and maintenance. Such seasonal maintenance and restoration of inhabitation sites and landscape features are seen in the



Figure 6.44: Photographs of spoil heaps outside of cisterns.

ethnographies discussed in Chapter 2. Stratified floor deposits of dung and domestic debris would have indicated the reuse and maintenance of corrals and tent foundations, but the HMTS team was not permitted to excavate these areas. Evidence for the long-term functioning and maintenance of dams and cairn fields would have required additional geological and sediment studies as well as excavation, activities that were again not possible within the scope of the HMTS permit. However, overall, dams and cairn fields represent small-scale pasture improvement systems likely requiring little maintenance for their long-term function.

The physical characteristics of the features indicate their purpose as fixed investments in the herding resources of the area and in some cases their long-term use; it remains to further explore the effect of these features on the environment and to investigate the role of these features in organizing the landscape and orienting seasonal reinhabitation. This investigation, in Chapter 7, will involve analyses of the spatial relationships between different classes of features and between certain classes of features and the environment.

CHAPTER 7: NOMADIC PASTORAL LANDSCAPE ANCHORS AND LOCAL MOVEMENT SURROUNDING HIRBEMERDON TEPE

Introduction

Where archaeologists have investigated pastoral nomads, they have tended to focus on the internal arrangement of campsites or historically and ethnographically reconstructed regional migration routes rather than on pastoral nomadic landscapes and interaction with the environment immediately surrounding campsites (see Ullah 2011 for an exception). As a result, archaeologists do not understand aspects of historically-specific nomadic pastoral land-use in the past, including conceptions of space and modification of natural resources. In fact, existing models have largely assumed that historically-specific strategies did not exist. The default assumption is frequently that itinerant pastoral communities inhabited only the marginal regions to which they were relegated, the area void of sedentary settlement, in a mobile but timeless, unchanging state of being. The role of manipulated natural resources and landscape anchors in the past is of crucial importance in the context of mobile pastoral societies whose existence was dependent on seasonal migration in semiarid areas. These societies typically did not produce urban centers or historical documents, and examining the organization of their landscapes is one of the few opportunities archaeologists have to gain a window into their history, daily activities, and senses of place.

The data presented in Chapter 6 demonstrated that pastoral nomads of the last 500 years in southeastern Turkey invested in their landscapes in various ways. The goal of the present chapter is to examine the spatial organization of the archaeological sites and landscape features described. Ethnography and the feature descriptions in the previous chapter suggest certain patterned relationships might exist between different classes of features and between these features and the environment, but these patterns remain to be demonstrated quantitatively and

graphically. Here such patterns will be investigated using measures of accessibility and proximity, topographic models, and analyses of multispectral satellite imagery.

The analyses focus on what spatial patterns reveal about the role of landscape anchors and what these patterns reveal about daily pastoral movements. The site and feature descriptions in Chapter 6 have demonstrated that pastoralists invested in the landscape; the analyses here are used to argue that several classes of features were landscape anchors: fixed features designed to improve the availability of water and pastures, features that show evidence for re-use and maintenance and that may have structured camping and herding patterns over extended periods of time. As no precise dates are available for the surveyed sites, the spatial analyses consider all of the surveyed sites together as representative of overall land-use patterns over the last 500 years.

This chapter demonstrates the potentials of a landscape archaeology approach to pastoral nomadic inhabitation. With high-resolution survey data and satellite imagery analyses, applied in suitable regions, it is possible to investigate the investments that pastoral nomads made in the local landscape. Clues to both the organizational logics of these local landscapes and movement patterns within them are recoverable. Many different satellite imagery datasets are available for the globe, and there is a large gap in resolution between many of the freely available (lower resolution) and commercially available (higher resolution) datasets. As was shown in Chapter 6, only the highest resolution imagery is sufficient for identifying and mapping nomadic pastoral sites. However, lower resolution datasets can be used to identify relationships between pastoral inhabitation and the environment as well as the effects of pastoral landscape anchors on the environment.

Explanation of Basic Measures

Before discussing the results, it is necessary to provide some background on the measures which form the basis of the spatial analyses conducted in this chapter. These measures include

accessibility and proximity derived from digital elevation models (DEMs) generated from satellite terrain data and vegetation indices calculated using multispectral satellite imagery.

Distance and Proximity Using Digital Elevation Models: Cost Surfaces, Cost Allocation, and Least Cost Paths

The topography of the study area is uneven, so Euclidean (i.e., straight-line) distances are misleading. Sites and features that appear proximate often have intervening topographical highpoints and even rock cliffs. For this reason, it is better to use “cost surfaces” for assessing movement. On a cost surface, the value of each pixel represents the relative ease of accessing that location. The cost distance for each pixel can be calculated from a particular location or group of locations (input as a set of points, lines, or polygons), given both Euclidean distance and information about the relative ease of moving through the landscape (Conolly and Lake 2006; Wheatley 1993). The simplest and most common type of cost surface takes into account slope and Euclidean distance and is used here. Such cost surfaces provide a better measure of proximity and accessibility in the HMTS landscape than Euclidean distance alone.

Cost-surface based analyses of movement have been employed in pastoral nomadic landscape analysis. An archaeological study of landscapes in Central Asia employed more complex cost rasters across much larger regions of Kazakhstan (Frachetti 2008). Reasoning that vegetation availability also affected pastoral groups’ choices of how to move across the landscape, these least cost paths also considered the type and quality of pasture in a given area. This modeling drew on ethnographic information about the nutritive quality of different types of vegetation, and it attempted to isolate different types of vegetation in broad regional space using multispectral satellite imagery.

More complex cost rasters and least cost paths were not possible or appropriate for the Hirbemerdon Tepe Survey data for several reasons. First, ethnographic data concerning the relative value of different types of vegetation were not available. Furthermore, the HMTS covered a small region with a relatively homogeneous vegetation regime. Finally, Frachetti’s

Central Asian study was designed to predict areas within a large region that might have been used for pastoralism in the past, while the HMTS examined the organization of pastoral landscapes at a local scale. The HMTS' mapping of campsites and associated features demonstrated which areas of the landscape had been most heavily utilized and showed that most of the survey area must have been traversed by pastoral groups; the information of interest was how proximate these features were to each other. At the scale covered by the HMTS, least cost path analysis does not make sense. Ethnographies documenting daily pastoral rounds in Scotland (Gray 1999), New Zealand (Dominy 2001), and Iran (Watson 1979) indicate that pastoralists developed their daily movement patterns in ways that maximized the visibility of the animals rather than ways that minimized the energetic costs of movement, particularly at points of danger for the herd. In particular, shepherds sought out topographically higher lookout points from which they could ensure the well-being of the animals. These movements involved circuitous treks on the part of the shepherd. Such principles of movement are incompatible with efficiency of movement and least cost paths. Moreover, the HMTS lacks spatial control over what might constitute a point of high visibility or danger for the sheep and shepherds using this particular landscape, so it is not possible to quantify these attributes in a more complex cost surface.

For the analyses presented here, cost surfaces were calculated using the locations of natural or archaeological features and a DEM generated from the Shuttle Radar Topography Mission (SRTM) terrain model, one of the highest resolution global topographic datasets. For example, a cost surface representing the distance to seasonal drainages is shown in Figure 7.1. Green represents areas that are most proximate to the input features, while red represents areas that are least proximate.

Another useful analytical method is cost allocation. This method assigns each location to the nearest feature on the basis of least accumulative cost distance. The result of this analysis is a set of polygons representing what might be termed "areas of influence:" areas where the cells are closer (in terms of cost distance, not Euclidean distance) to a given feature within that polygon

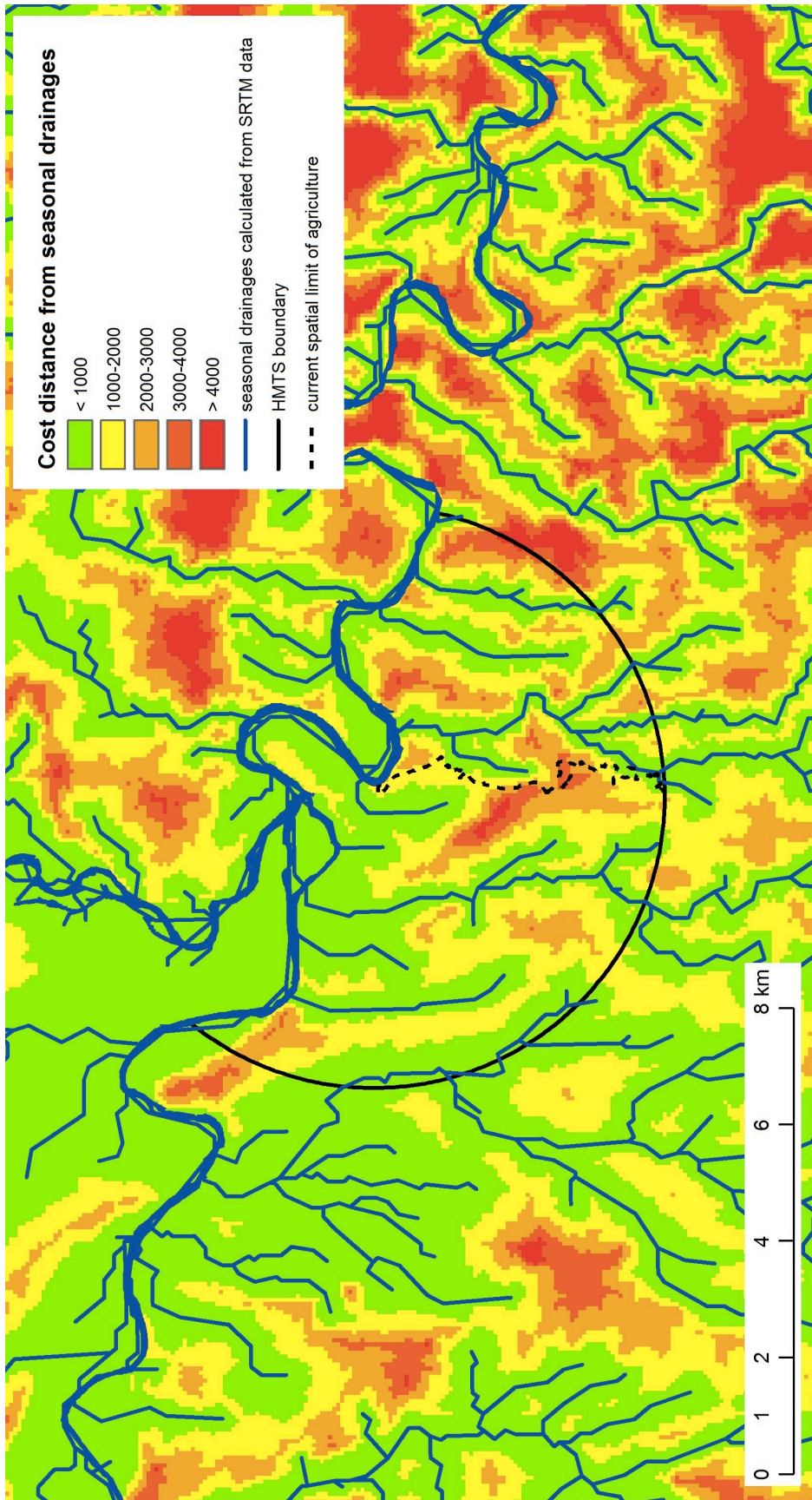


Figure 7.1: Cost distance from seasonal drainages and the Tigris River within the HMTS area.

than they are to any other features. As an example, the cost allocation for all surveyed inhabitation sites (tells, abandoned villages, and campsites) on the basis of terrain slope and distance is shown in Figure 7.2. This cost allocation appears similar to the output of the Thiessen polygons for the inhabitation sites (Figure 7.3). However, the latter method (also known as the Voronoi tessellation) treats the landscape as an isotropic plane by considering only Euclidean distance. The cost allocation in Figure 7.2 takes into account an environmental anisotropy—topographic slope—and therefore represents a more realistic approximation of how people and animals move through uneven terrain.

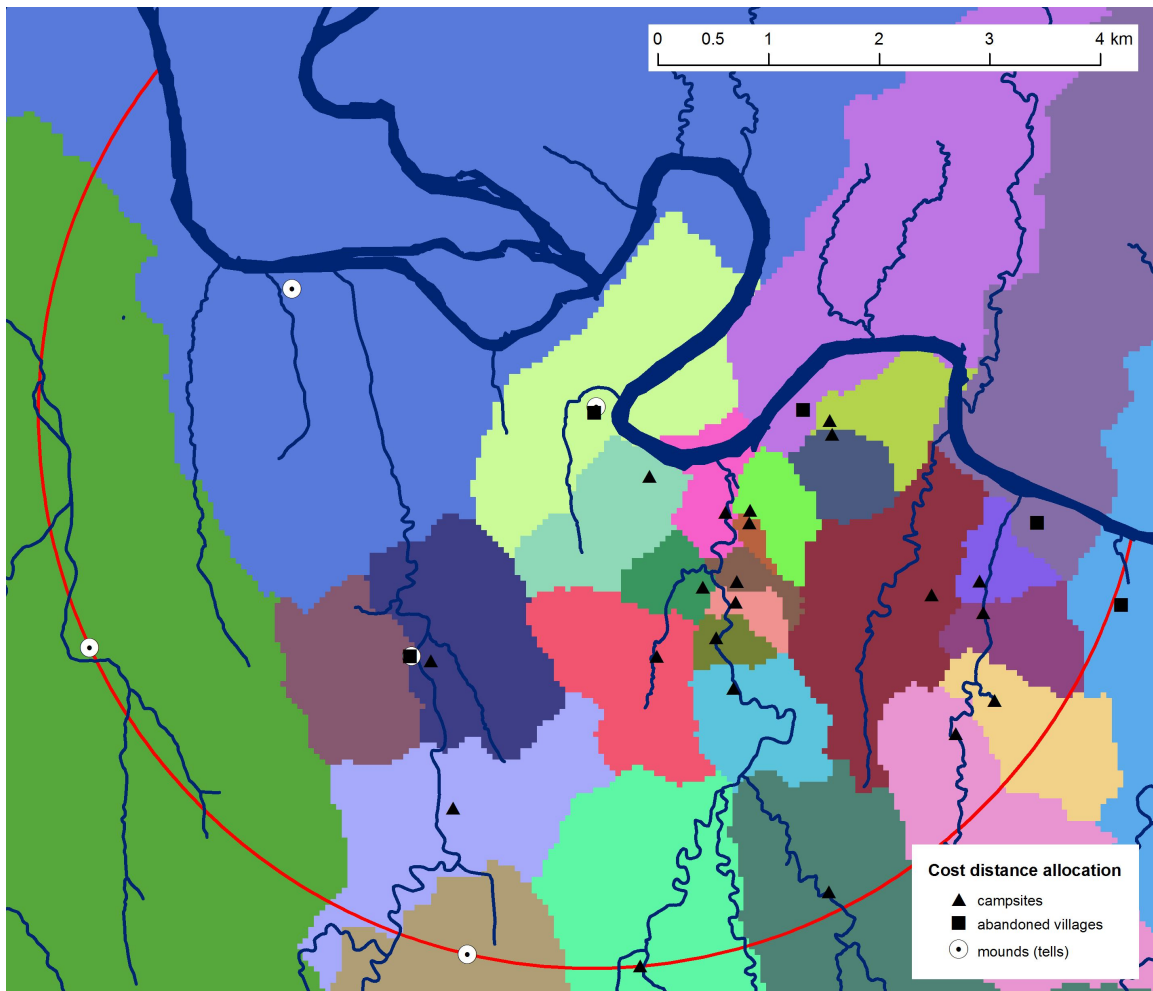


Figure 7.2: Cost allocation for all surveyed inhabitation sites, including tells, abandoned villages, and campsites, on the basis of slope and distance.

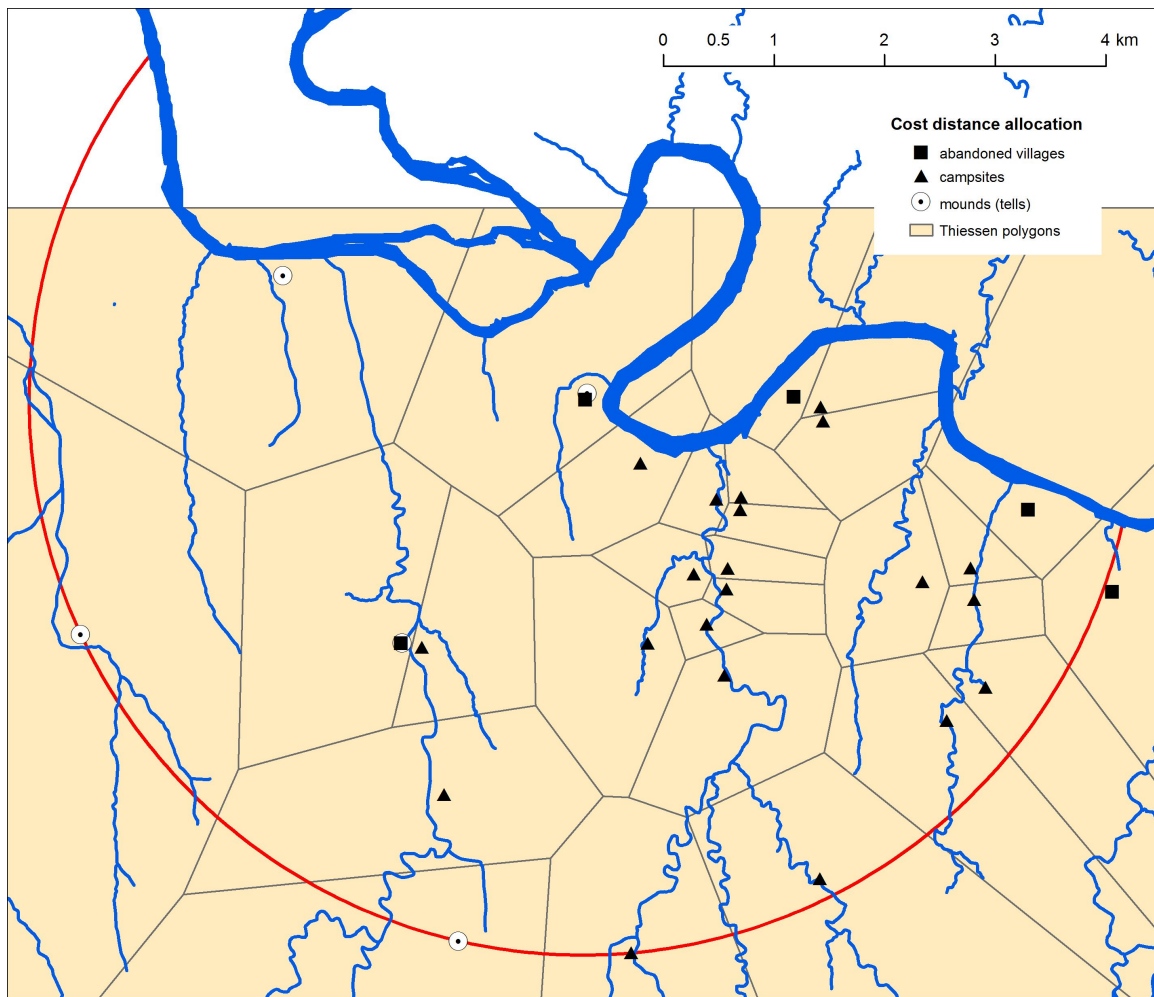


Figure 7.3: Thiessen polygons corresponding to the surveyed inhabitation sites, including tells, abandoned villages, and campsites.

The spatial resolution of the cost distance and cost allocation rasters depends on the spatial resolution of the raster input, the SRTM DEM. Publicly available SRTM DEMs outside of the United States have a resolution of 90 meters. The present project covers a small region and investigates ephemeral sites and fragmented pasture areas; therefore this DEM dataset is coarse for its purposes. Thirty meter-resolution STRM data, of nine times greater resolution, is freely available only for the United States, but with proper NASA contacts, derivative 30 meter resolution data may be obtained for other areas of the world. The DEM used in the calculation of cost rasters in this chapter was generated using 1 meter topographic contours derived from 30

meter SRTM data and topographic spot heights vectorized from 1:25,000 maps of the study region. Together, these two datasets produced a DEM of significantly greater resolution than the available 90 meter SRTM data.

Although not utilized in this study, a recently available source of global terrain data is the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) sensor. The first publicly available ASTER Global Digital Elevation Model (GDEM) product, released in June 2009, had a reported 30 meter resolution, making it nominally nine times higher in resolution than the freely available SRTM imagery. However, a number of studies concluded that the actual resolution of the ASTER GDEM Version 1 was considerably lower, contained serious flaws, and was in many cases inferior to the SRTM DEM. In late October 2011, a Version 2 of the ASTER GDEM was released. It reportedly corrects the inaccuracies of the Version 1 product. However, Version 2 data for the study region was not available until after the analyses in this chapter had already been completed. For these reasons, the decision was made to generate a DEM from 30 meter SRTM-derived data rather than using the ASTER GDEM.

One of the most useful cost surfaces for the analyses that follow shows cost distance from the incised seasonal drainages (Figure 7.1). The hydrology generated from 30 meter DEMs is not accurate enough that the resulting cost surfaces will show small highly local differences in cost distance surrounding the campsites and features. To improve the accuracy of the cost surfaces, the paths of drainages were traced at high resolution from georeferenced Digital Globe images (e.g., Figure 7.26). Particularly in the uneven topography of the eastern uplands, numerous tiny side drainages exist, not all of which could be traced. To ensure uniform treatment of all of the traced drainages, their lengths and confluent side drainages were traced only as far as the 90 meter SRTM DEM hydrological model indicated that these drainages had a flow accumulation of 100 pixels or more (i.e., collected water from greater than 810,000 square meters of surface area).

Terrain Roughness and Ruggedness Using Digital Elevation Models

Roughness and ruggedness terrain indices show the degree to which the ground surface is uneven and are frequently directly correlated with erosion as well as indirectly correlated with vegetation quality. Comparison of the relative roughness and ruggedness of the terrain across the survey area was carried out using the same DEM generated using 30 meter SRTM-derived data. Roughness and ruggedness of the terrain were quantified using overlapping neighborhood statistics, or focal functions, in ArcGIS. Such focal functions create a raster in which the pixel value at each location has been calculated from the cells in a specific neighborhood surrounding the location. For example, the “focalmax” function creates a raster where the value of each cell is the maximum value within a neighborhood of that cell, and the “focalmean” function creates a raster where the value of each cell is the average of the cell values within the specified neighborhood. For the indices described below, a rectangular neighborhood of 5 cells X 5 cells (i.e., a 75 x 75 m area on the ground) was implemented.

I defined a ruggedness function as the absolute value of the difference between the 5 X 5 focal mean height and the height of the center cell (Figure 7.4) and a roughness function as the absolute value of the difference between the 5 X 5 focal max height and the height of the center cell (Figure 7.5). Mathematically, this is

$$\text{Ruggedness} = |\text{focalmean}([x], \text{rectangle}, 5, 5) - [x]| \text{ and}$$

$$\text{Roughness} = |\text{focalmax}([x], \text{rectangle}, 5, 5) - [x]|,$$

where x is the elevation at a particular point according to the input elevation model. The two functions are separate but correlated ways of measuring the unevenness of the terrain.

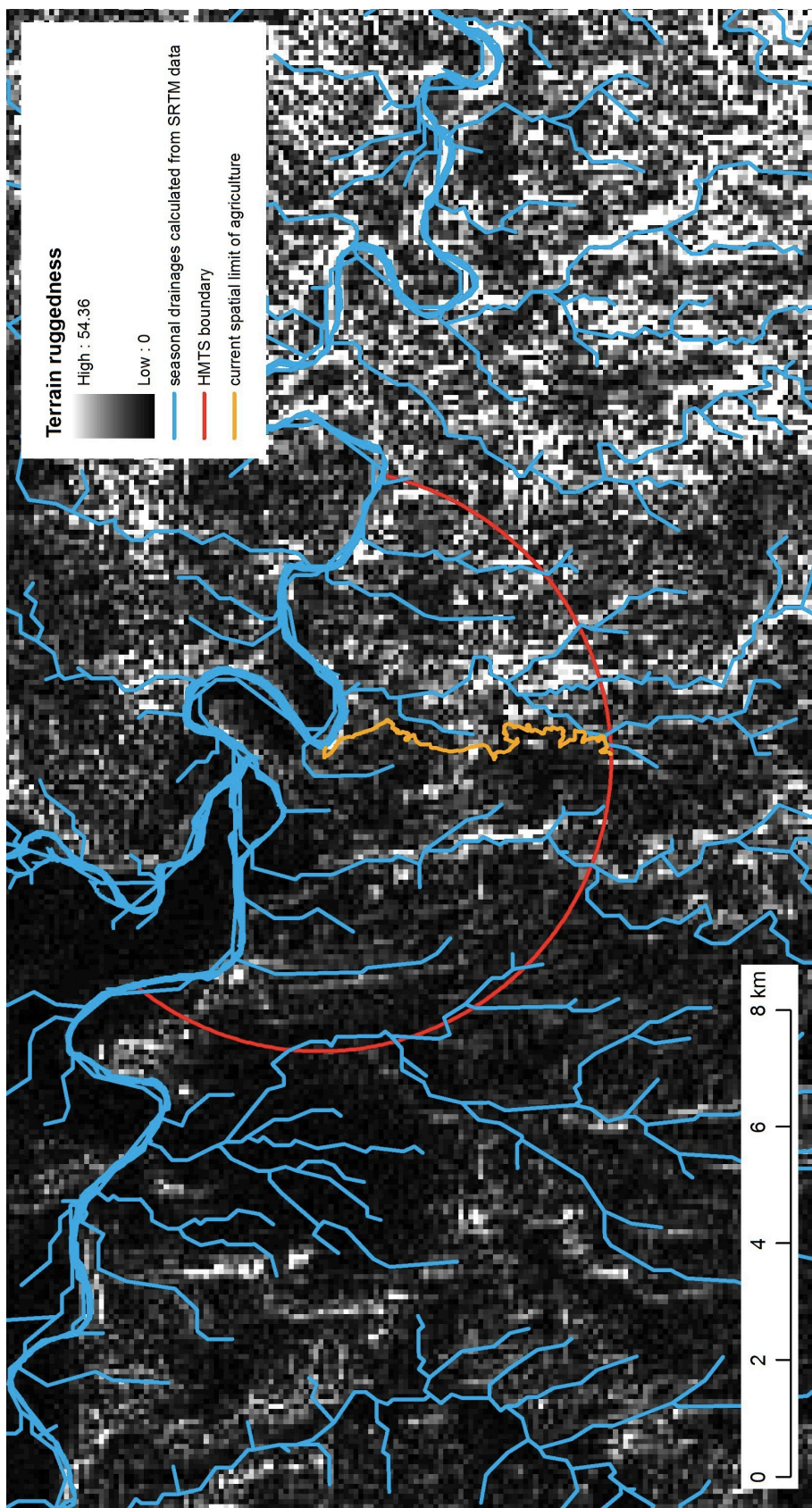


Figure 7.4: Terrain ruggedness within the HMTS.

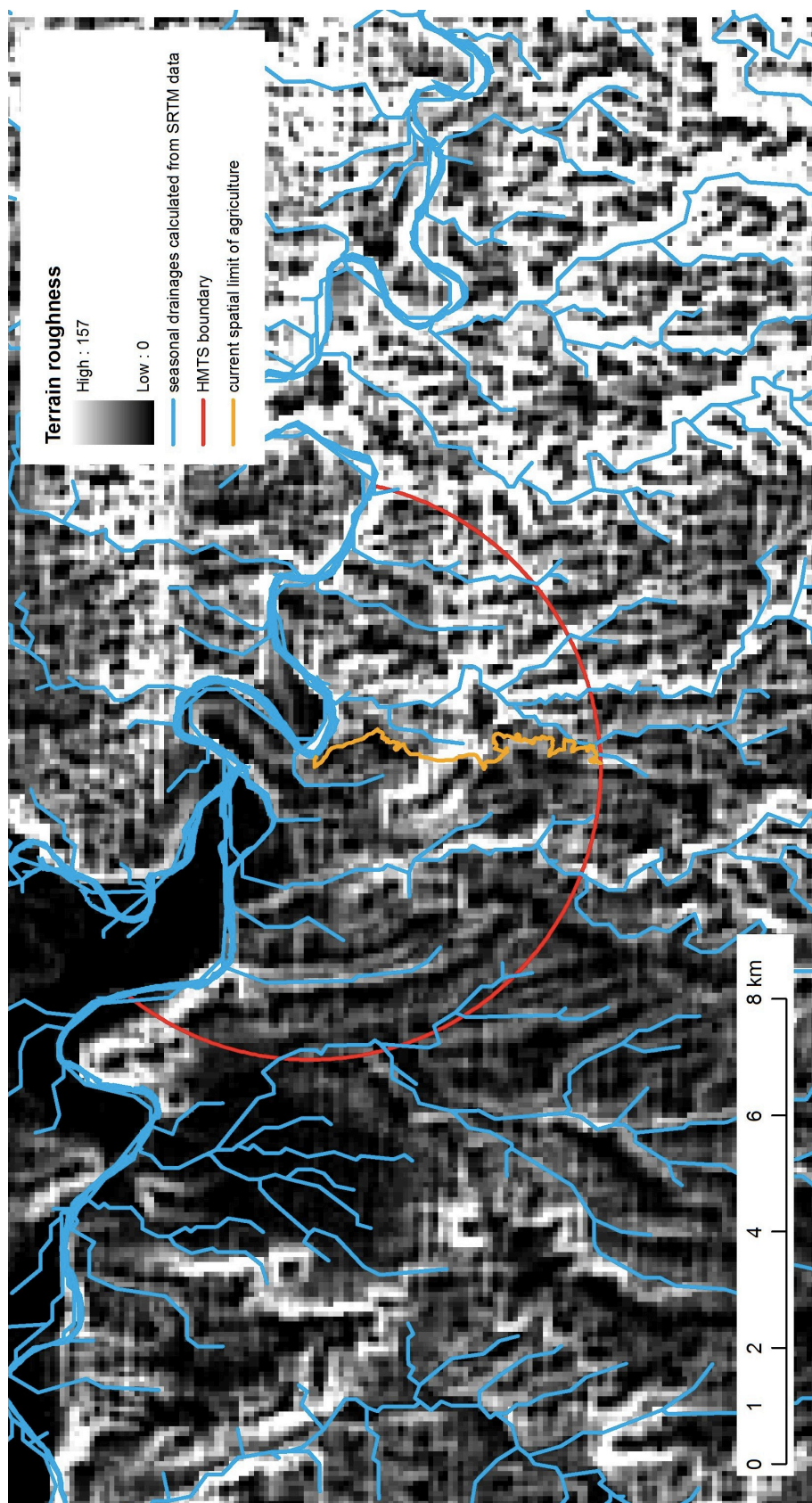


Figure 7.5: Terrain roughness within the HMTS.

Multispectral Satellite Imagery and the Normalized Difference Vegetation Index

Multispectral satellite imagery can detect differences in vegetation and soil characteristics. This study employed scenes from two such multispectral imagery sources, the Landsat and ASTER sensors. Since 1972, the Landsat program has launched seven different satellites, and images from the two most recent successful missions (Landsat 5, launched 1984, and Landsat 7, launched 1999) were used for the analyses in this chapter. The ASTER sensor, aboard the Terra Satellite (launched 1999) has been producing images since 2000. Multispectral Landsat and ASTER sensors measure spectral reflectance in the visible and infrared regions. Additionally, the study had access to a single scene of multispectral IKONOS imagery (capture date 23 May 2005). The visible and near-infrared Landsat bands used in this chapter have a spatial resolution of 30 meters, the parallel bands of ASTER have a four times greater spatial resolution of 15 meters, and those of IKONOS have a roughly 14 times greater spatial resolution of 4 meters. While the IKONOS scene has the advantage of significantly greater spatial resolution, only one scene and thus only one set of spectral reflectance values was available. Although lower in resolution, the Landsat and ASTER datasets have an advantage in that multiple scenes were available for the study region, making it possible to look at variability in spectral reflectance over time.

The multispectral bands may be combined or mathematically manipulated to highlight different aspects of the landscape. One of the most common manipulations is the Normalized Difference Vegetation Index (NDVI). NDVI uses the near-infrared and visible red bands to assess the presence of vegetation and soil moisture. The index is the difference between the visible red and near infrared bands divided by their sum. Mathematically, this is written

$$NDVI = (NIR - VIS) / (NIR + VIS),$$

where NIR and VIS are the spectral reflectance in the near infrared and visible (red) regions of the electromagnetic spectrum, respectively.

In ArcGIS 10, NDVI was calculated using the Image Analysis toolbar. By default, the toolbar multiplies the NDVI value for each pixel by 100 and adds 100 to result in a value range of 0-200. This facilitates display in an 8-bit colormap where green indicates areas with vegetation and red indicates areas without vegetation.

$$\text{ArcGIS NDVI} = ((\text{NIR} - \text{VIS}) / (\text{NIR} + \text{VIS})) * 100 + 100$$

The basic NDVI formula yields values between -1.0 and 1.0. Values near zero and negative values (<0.1; <110 in the transformed ArcGIS rasters) indicate non-vegetated surfaces such as rock, sand, and barren soils, as well as water, snow, ice, and intervening clouds.

Moderate values (0.2-0.3; 120-130 in the transformed ArcGIS rasters) typically represent shrub and grassland environments. Values close to one (0.6-0.8; 160-180 in the transformed ArcGIS rasters) represent the densest possible vegetation cover, as found in temperate and tropical rainforests.

The NDVI works due to the reflectivity of vegetation in the near infrared region of the electromagnetic spectrum. Chlorophyll absorbs most incoming sunlight in the visible light region of the electromagnetic spectrum. Plants' mesophyll leaf structure is highly reflective in the near-infrared region of the spectrum (Jackson, et al. 1983; Tucker, et al. 1991; Tucker 1979). If there is more reflected radiation in near infrared wavelength than in visible wavelengths, then the vegetation in that pixel is likely to be dense. If there is very little difference in infrared and visible red reflectance, then vegetation is either sparse or unhealthy, resulting in an NDVI value near zero. Healthy vegetation has low red reflectance and high near infrared reflectance, resulting in a high positive NDVI value. Clouds, water, and snow reflect more visible light and less near infrared light, resulting in a negative NDVI value (Lillesand, et al. 2004: 468-469).

The basic NDVI distinguishes between vegetated areas and other surface types, but its values are often sensitive to other factors, including atmospheric haze, soil moisture, and soil brightness. Particularly where vegetation cover is low ($< 40\%$), reflectance in the visible red and infrared spectra may influence vegetation index values. These circumstances are especially problematic if comparisons are to be made across different soils with different brightness properties and moisture retention properties (e.g., Lyon 1998; Richardson and Everitt 1992).

Since the development of NDVI in the 1970s, various modified vegetation indices have been developed to deal with these problems, including the Soil-adjusted Vegetation Index (SAVI), the Modified Soil-adjusted Vegetation Index (MSAVI), the Soil-adjusted Total Vegetation Index (SATVI), and, most recently, the Enhanced Vegetation Index (EVI) (e.g., Jensen 2000; Lyon 1998; Richardson and Everitt 1992; Running 1994). While the first three indices are attempts to resolve the soil brightness problem, the final index, EVI, corrects for both atmospheric haze and for differences in the land surface beneath vegetation. EVI also does a better job of showing variability in highly vegetated environments (Running 1994). The original NDVI formula was applied to imagery of the study area instead of these modified formulas because the small study area is semi-arid and has fairly uniform soil characteristics throughout. Thus, soil brightness and moisture retention are not likely to be confounding factors in assessing relative vegetation cover, and variability within areas of extremely dense vegetation coverage was not a concern.

The primary reason for calculating NDVI values for the study region was to assess the general likelihood that different areas would have contained abundant uncultivated pasture grasses. Environmental scientists, animal ecologists, and policy makers around the world have used NDVI in a variety of contexts to assess the spatial characteristics and quality of rangelands as well as the impact of pastoralism on grassland landscapes (e.g., Boschetti, et al. 2007; Kogan, et al. 2004; Richardson and Everitt 1992; Wylie, et al. 1991). The Central Asian case study

discussed above (Frachetti 2008) employed multispectral satellite imagery to assess potential quality of pasture as well.

The NDVI results for the HMTS area highlight both agricultural fields and areas of dense uncultivated vegetation (Figures 7.6, 7.7, and 7.8). With respect to the fields of the western HMTS area, the NDVI results show patterns of cropping and harvest. The highest NDVI values are uniformly found in the western part of the survey area within agricultural fields that were placed under crop in the late winter and early spring. These fields appear as white areas with clearly defined rectilinear borders. Some fields appear in black, indicating low NDVI values. These fields may have been left for planting later in the year (as with cotton fields and vegetable and watermelon patches, which are planted and sprout considerably later in the spring than cereal crops). These fields also may have had been left fallow, and given their extreme bareness, may have been burned at the end of the previous year's summer harvest. Burning the chaff left on these fields helps return nutrients to the soil and discourages the growth of weeds.

In the eastern part of the survey area, evidence for modern and pre-modern fields is limited to a few locations, and the NDVI patterns are more likely to be related to uncultivated vegetation and natural moisture. Areas of particularly high or low NDVI values do not have clear borders; there is gradual variation in values across the landscape. A comparison of Landsat NDVI to the mapped location of the small modern and pre-modern agricultural fields mapped in the eastern uplands using IKONOS imagery shows that areas of high NDVI value do occasionally correspond to areas of agricultural fields (Figure 7.12). One might question, therefore, whether the high NDVI values in the eastern area really indicate the quality uncultivated pasture; alternatively, they might indicate the locations of former fields. These two possibilities are not mutually exclusive. The small and fragmented fields in the eastern uplands would not have been irrigated, so it is likely that they were placed in the moistest areas with the best soils—the same locations where one would expect to find the densest uncultivated vegetation. Furthermore,

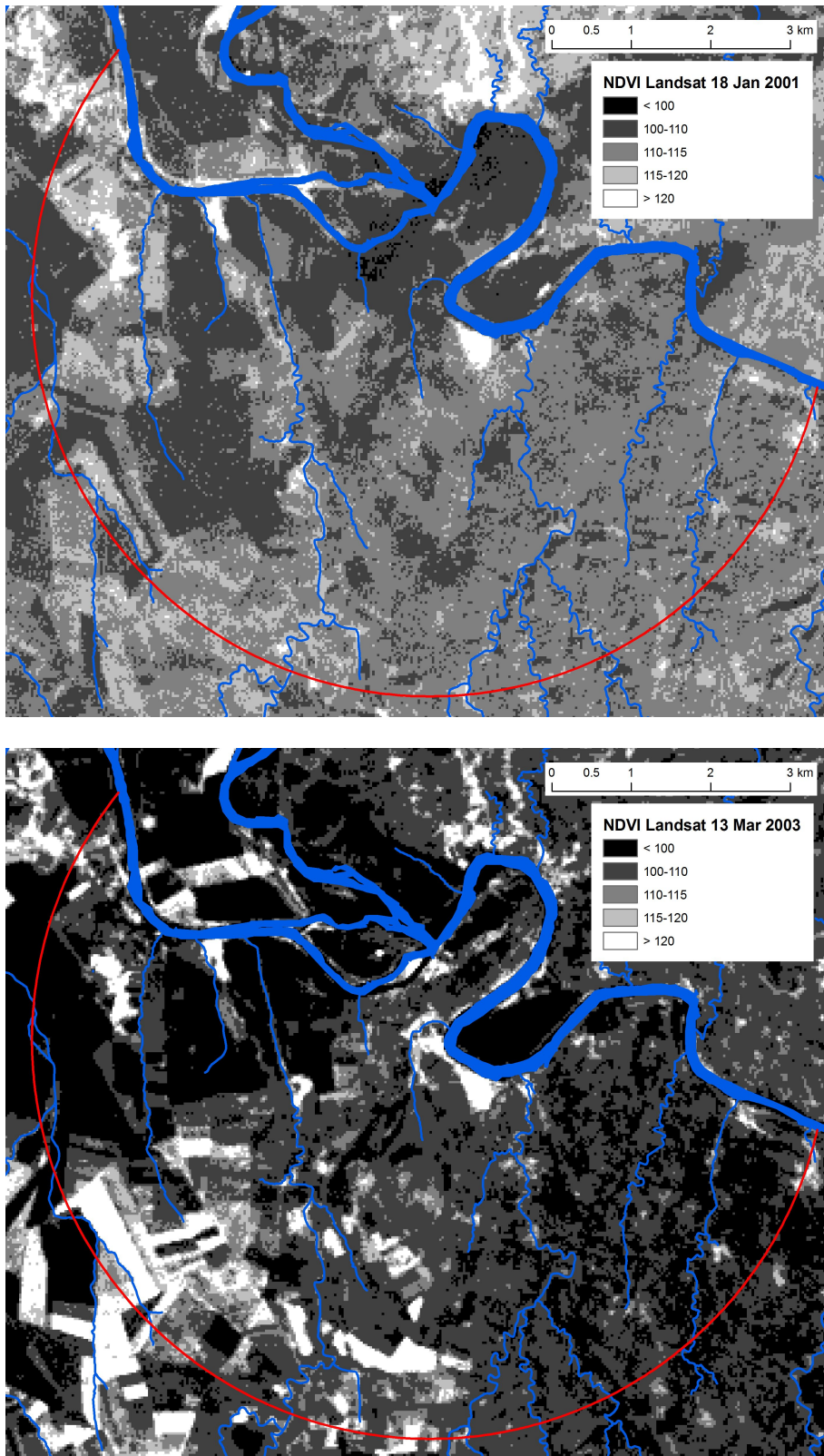


Figure 7.6: NDVI of two Landsat scenes. Top: 18 Jan 2001. Bottom: 13 March 2003.

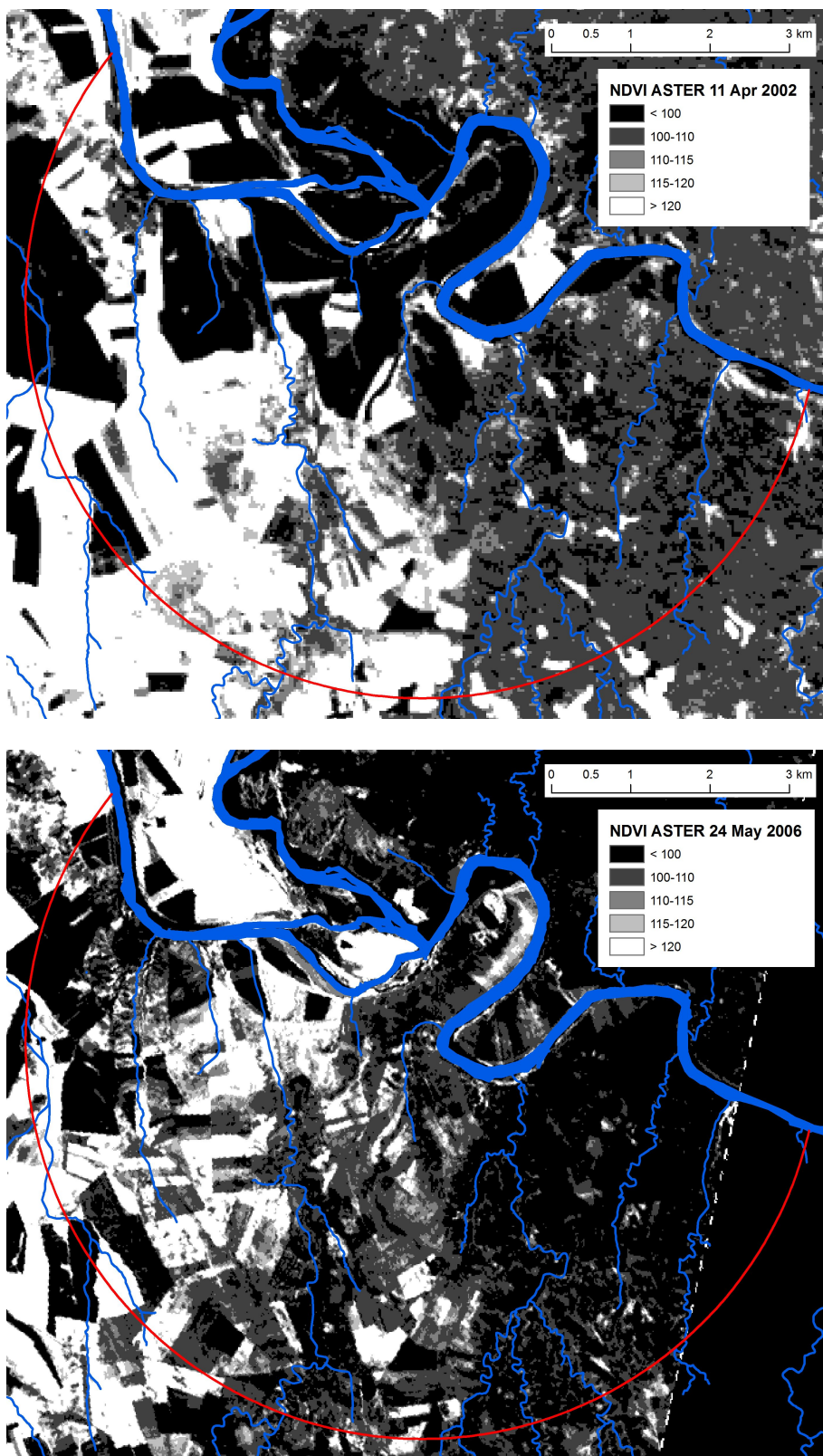


Figure 7.7: NDVI of two ASTER scenes. Top: 11 April 2002. Bottom: 24 May 2006.

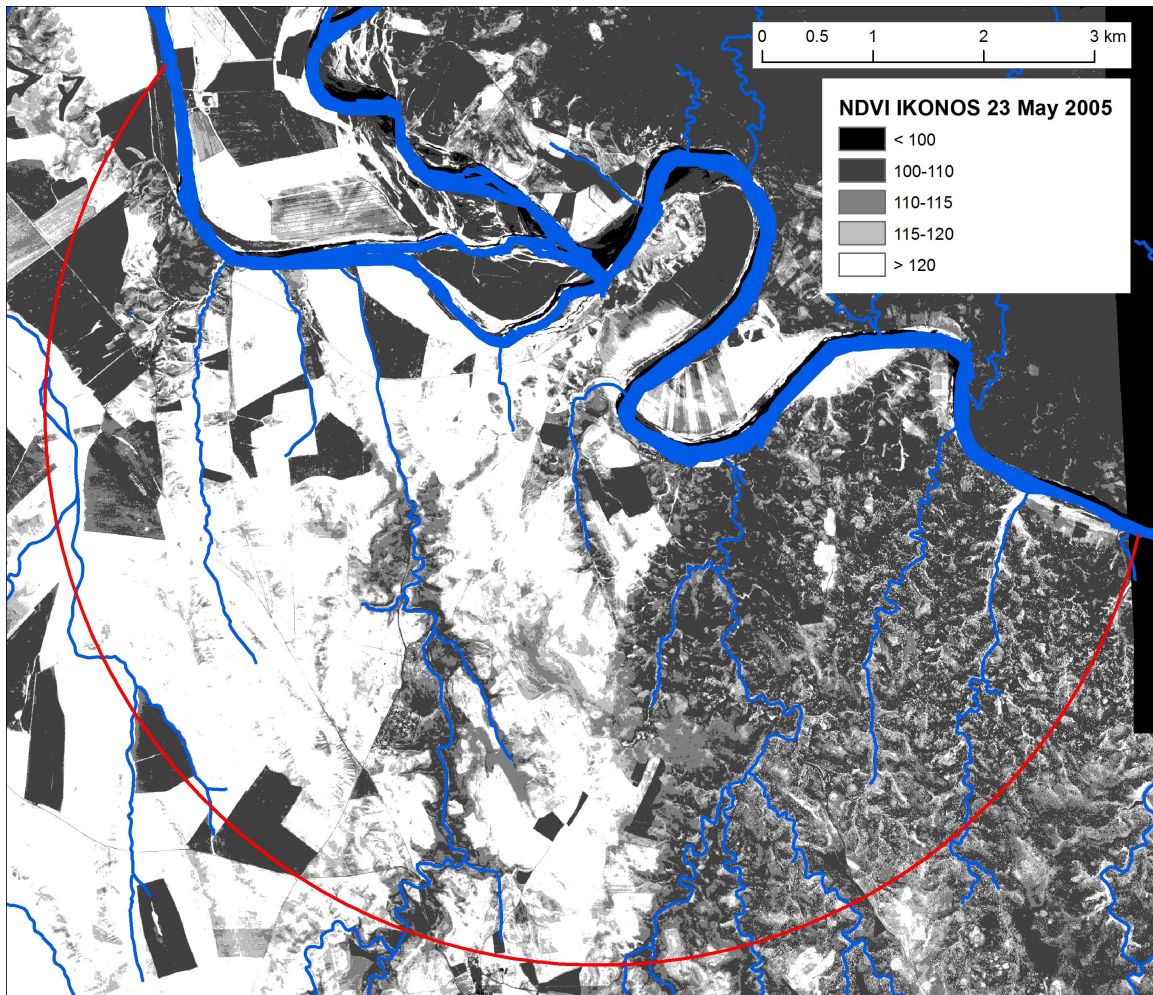


Figure 7.8: NDVI of one IKONOS scene, capture date 23 May 2005.

during subsequent years of fallow or abandonment, these areas would host dense growth of uncultivated pasture grasses. During the period that the HMTS team was working in the area, small fields in the upland area were never burned following the harvest, and thus were quickly overgrown with weeds and natural grass once left fallow or abandoned. On these bases, the NDVI values of the eastern uplands are considered broadly indicative of the ability to support uncultivated pasture grasses.

Images for NDVI analysis were selected on the basis of season and cloud cover. Only images from the winter and early spring months (December-April) with less than 10% cloud cover were considered. Most of the annual precipitation falls in these months, and thus this is the

period during which the water collection features would have been functional and the period during which uncultivated vegetation is most likely to have been healthy. For these reasons, this is also the period during which the campsites are most likely to have been inhabited. In the case of the modern campsite (Site 36), this was when pastoral nomadic groups inhabited the region.

The NDVI results revealed a high degree of inter-annual and seasonal variability in vegetation coverage. In light of this fact, the results from any single image might not be representative. NDVI variability could be factored into the analysis via a composite raster that displayed the average value for several Landsat images acquired in winter months (Figure 7.9).

Average NDVI rasters should be calculated with data from a single satellite sensor because each sensor has different characteristics, measures reflectance from different angles and positions, and collects data in different spectral ranges. For these reasons, the NDVI formula yields different, though correlated, results for each instrument. When choosing images to contribute to the composite, it was important to ensure that no trace of clouds covered the study area. While clouds are clearly visible as anomalies in individual NDVI rasters, they would affect the composite average raster in ways that might not be readily visually identifiable. Table 7.1 lists the dates and numbers of the scenes that were compiled to create the average Landsat NDVI raster. Most of the analyses rely on the average Landsat NDVI raster, for which eight scenes were available.

Like the individual scenes, the composite NDVI images show substantive contrasts between the western and eastern halves of the survey area. In the western half, the average values are correlated with the number of times they were planted or left fallow over the years. In the eastern half, the average values are associated with the changing locations of small agricultural fields, but also with general trends in the coverage of uncultivated vegetation in the upland landscape. It is this last association that will form the basis of the pasture analyses below.

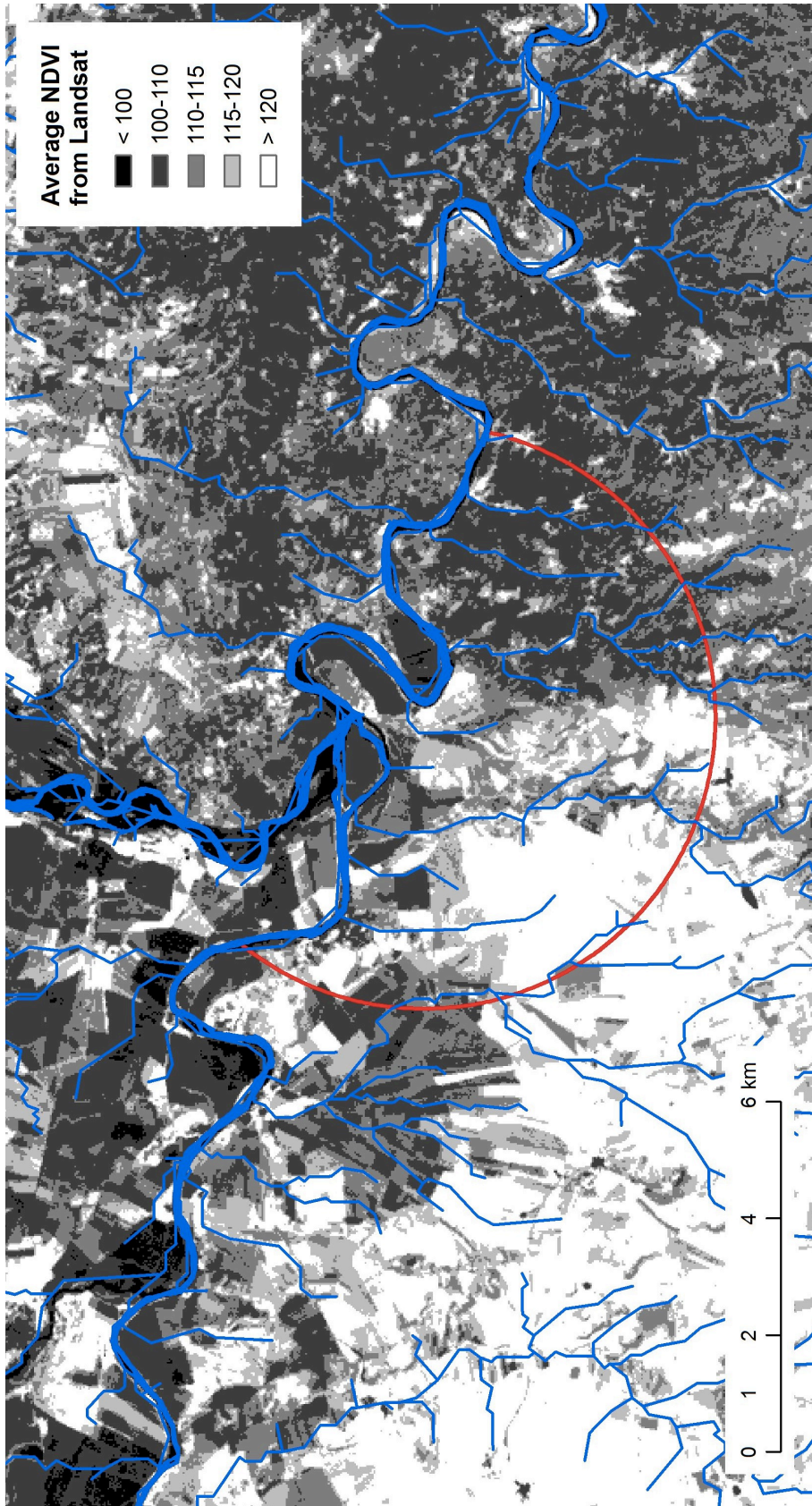


Figure 7.9: Average Landsat NDVI within the HMTS area.

<i>Dates of Landsat images</i>	
30 April 2003	18 January 2001
24 April 2001	13 March 2003
23 April 1986	12 March 2000
21 January 1999	10 March 2002

Table 7.1: List of the Landsat scenes used to generate the average raster in Figure 7.9.

West and East

The basic division between the western and the eastern portions of the survey area has structured the methods and analyses in this study. This division has thus far been defined in relationship to modern conditions: the spatial extent of twentieth century intensive agriculture and a subsequent zoning of the landscape into extensive agricultural fields of the river terraces and rolling steppe on one hand and pasturelands and spatially restricted agricultural fields of the uplands on the other. This division is apparent in NDVI rasters (Figure 7.10). The average Landsat NDVI image shows an abrupt change in values that corresponds to the boundary of the eastern-most agricultural fields of the river plain and surrounding steppe. To the west of this divide, rectilinear areas corresponding to the outlines of fields mostly have very high NDVI values, except in the case of fallow fields or fields reserved for later spring planting. To the east of this divide, most of the area is characterized by moderate or low NDVI values. The transitions between areas of low and high NDVI value are more gradual than in the west.

This west-east division also pertains to enduring topographic and environmental characteristics of the landscape. The terrain roughness index shows a clear west-to-east trend towards uneven terrain (Figure 7.5). The proportion of rough terrain (indicated by the color white) is substantially greater throughout the eastern uplands. This same pattern is even clearer in the terrain ruggedness index, where a clear shift from flat to more rugged terrain (the latter again

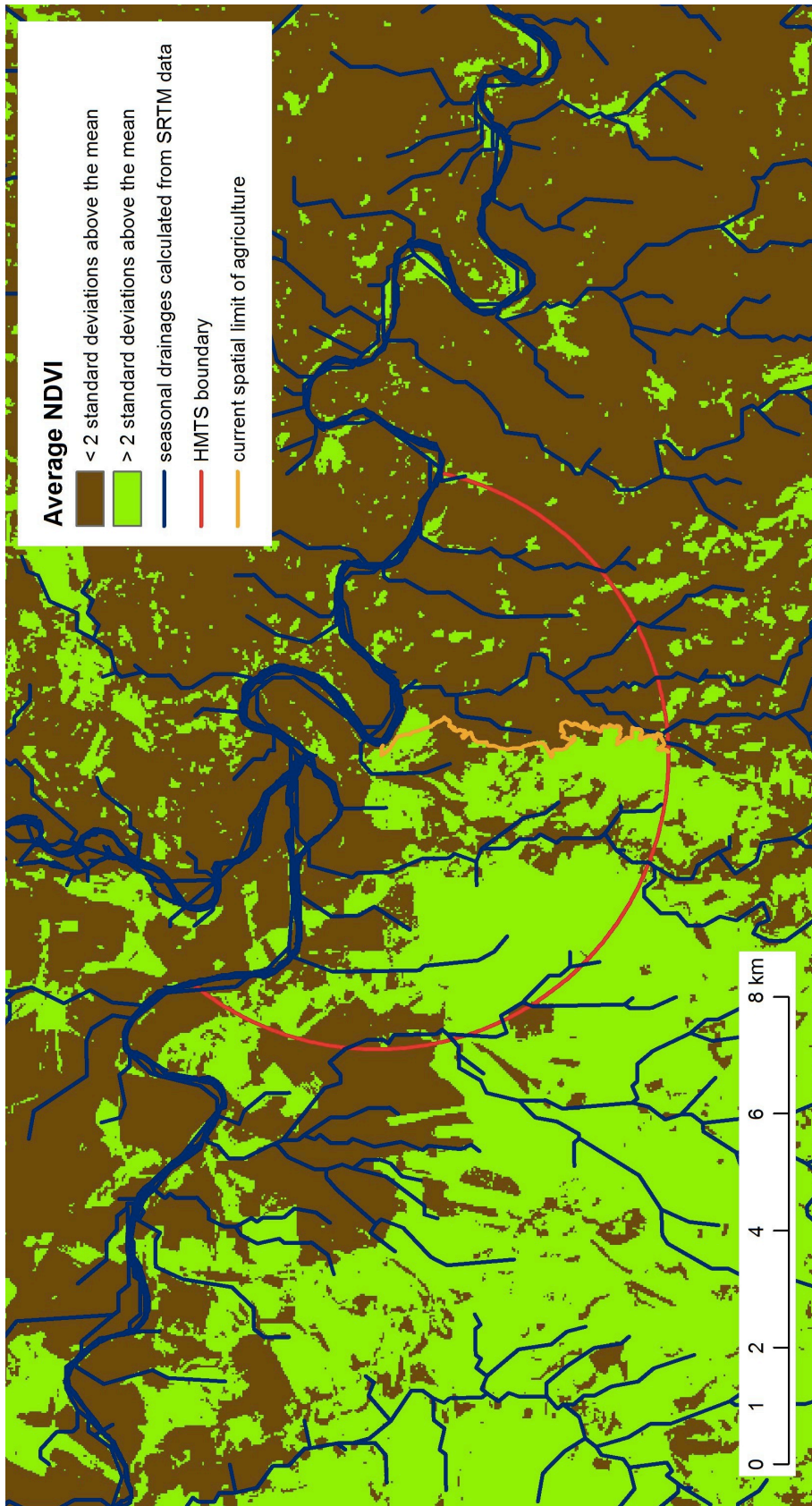


Figure 7.10: Division between the western and eastern parts of the study region according to NDVI.

indicated by the color white) corresponds to the spatial limit of modern agricultural fields (Figure 7.4). Both the terrain roughness and terrain ruggedness indices highlight the greater proportion of highly uneven ground surface in the eastern part of the survey area. Uneven ground surfaces are associated with erosion, an increased rate of water drainage following precipitation events, and an overall reduced vegetation potential. Other environmental effects of this rough and rugged terrain are highlighted by a cost raster showing cost distance from seasonal drainages (Figure 7.1). Only in the eastern part of the survey area are there locations (typically topographic high points) where the seasonal drainages are relatively inaccessible (highlighted with the colors orange and red). These topographic high points hinder movement across the landscape, particular in a west-east direction, as well as access to what are likely the moistest soils surrounding the seasonal drainages.

The claim that that the features in the eastern uplands of the HMTS are associated with seasonal pastoral rather than sedentary agricultural land-use can also be more clearly demonstrated with cost distance and allocation rasters. In the absence of radiometric dates, these associations are based only on proximity. The cost allocation for all inhabitation sites (Figure 7.2) can be symbolized so that the cells closest to all sedentary agricultural sites are displayed in green and the cells closest to seasonal pastoralist sites are displayed in blue (Figure 7.11).

This reclassified cost allocation shows that most of the surveyed features in the uplands—that is, the majority of the identified corrals, caves, dams, and cisterns—are closest to campsites of seasonal pastoralists than to the villages and farmsteads of sedentary agriculturalists or agropastoralists. Several notable exceptions include the cluster of cisterns within the abandoned village of Otlú (site 102) and the cluster of cisterns near the east end of the modern village of Merdani (site 96), which sits on top a small mound that undoubtedly contains the

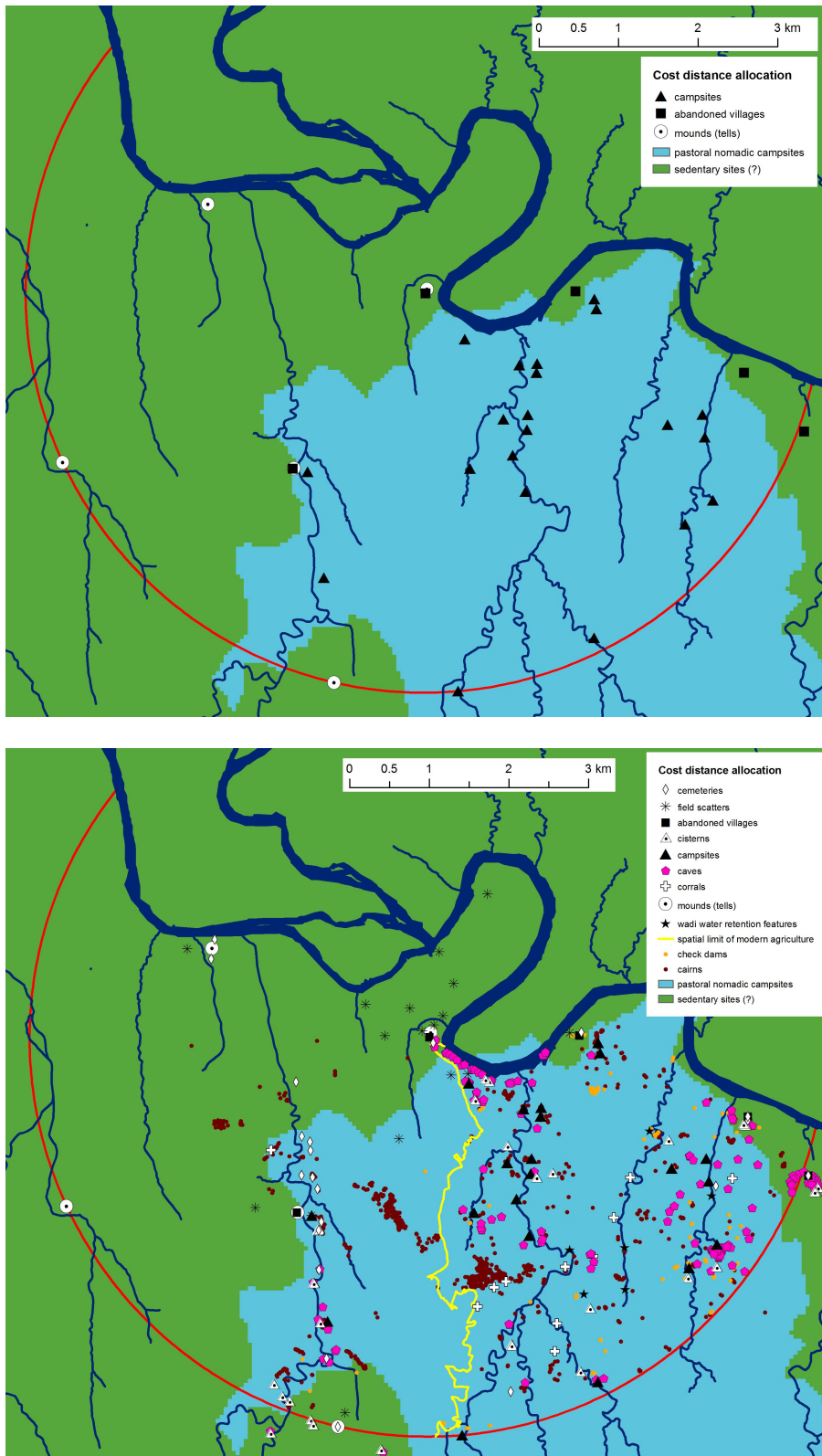


Figure 7.11: Cost allocation for all surveyed habitation sites compared to the distribution of surveyed landscape features.

foundations of earlier villages. The results of the cost allocation raster should be interpreted critically, however. They do not imply that sedentary villagers did not use or create features within the blue “pastoral” areas and that seasonal pastoralists did not use or create features within the green “agricultural” areas. It is important to keep in mind that the blue “pastoral” areas were only inhabited seasonally by pastoral nomads and could have been used for different purposes during the summer months. Nonetheless, features closest to the campsites are more likely to have been used by seasonal pastoralists and features closest to sedentary sites are more likely to have been used by agriculturalists or sedentary agropastoralists.

The Relationship Between Landscape Features and the Environment

The first group of proximity analyses investigated the spatial relationships between the various classes of surveyed features and the best pasture areas.

Definition and Location of Pasture

To explore the relationships between pasture and landscape anchors, it is first necessary to map out the best pasture areas. The average NDVI rasters were used to identify areas of the survey area with the best herding potential. Areas with the highest average NDVI consistently had the densest and healthiest winter and spring vegetation.

Areas with the highest average Landsat NDVI values were converted into polygons for the purposes of further spatial analysis (Figure 7.12). The value cutoff or “break point” for such polygons must necessarily be arbitrary. In a highly variable landscape such as the area around Hirbemerdon Tepe, any statistically-derived number will be highly sensitive to the area chosen for its calculation (a form of modifiable areal unit problem). For the polygons generated here, the break point was set at an NDVI value of 114.4. This number is one standard deviation above the mean average Landsat NDVI value for the survey area and its immediate environs.

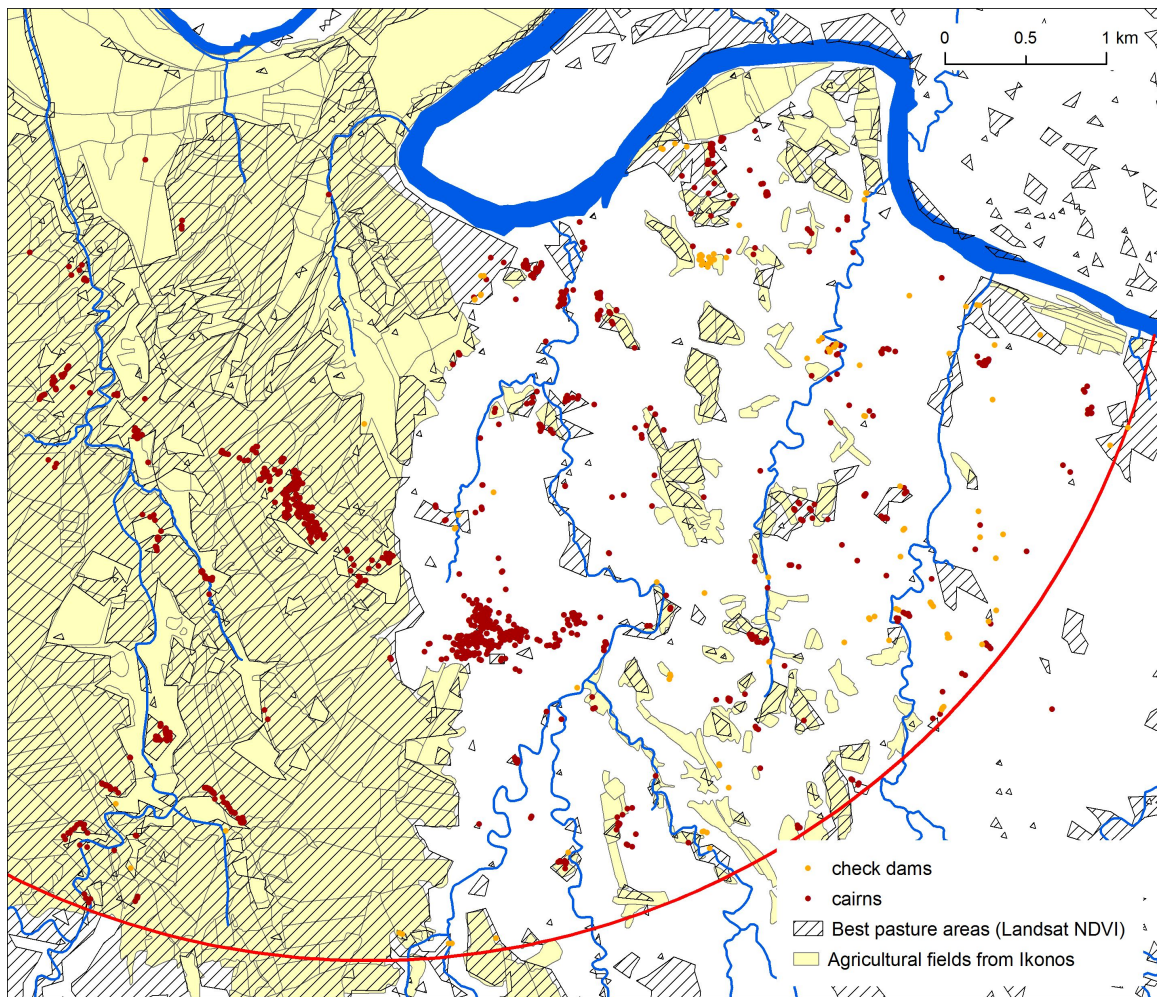


Figure 7.12: Polygons representing areas of highest average NDVI, and thus areas likely to contain the best pasture in the HMTS region, compared to the distribution of agricultural fields, cairns, and check dams.

These polygons represent the areas that were mostly likely to have had dense vegetation during the winter and spring months, and thus to represent the best “pasture areas” for the territory within the study region. Many of the polygons in the eastern uplands are extremely small in size, with a mean area of 1.23 hectares (range 0.0616-17.5277 hectares), and have a dispersed pattern, indicating the fragmentary nature of the best pasture areas. Many are located within the low, incised drainage systems, on the terraces surrounding the wadi beds. However, even larger tracks of pasture are located higher in the landscape, on the plateaus between the seasonal drainages systems but typically not on the highest ridges of these plateaus. Together, all of the pasture

polygons within the eastern part of the survey area cover an area of 162 hectares. This is 9.82% of the eastern survey area (1650 hectares total). This low percentage stands in stark contrast to the western part of the survey area, where the highest average NDVI polygons cover 21.18 square kilometers, about 69.4% of that part of the survey region.

Position of Campsites and Surrounding Features in Relationship to Pasture

The location of high quality vegetation strongly influenced the locations of campsites and the organization of local land-use. This is demonstrated quantitatively via a raster expressing cost distance from the pasture area polygons (Figure 7.13). In generating this cost raster, only pastures larger than 3500 square meters (0.35 hectares or at least 4- 30 X 30 meter pixels) were taken into account. The average NDVI results yielded many tiny areas of high values only one or two 30 X 30 meter pixels in size. It was thus necessary to remove the small patches of pasture that were unlikely to be worth herders' efforts to access.

The spatial association between campsites, isolated corrals, and pasture areas is readily apparent (Figure 7.15). On average, campsites are located at a cost distance of 134 from the best pasture areas and corrals are located at a cost distance of 765 from the best pasture areas.

Thirteen out of twenty-one campsites (61.90%) are located within pasture polygons (sites 18, 26, 36, 38, 39, 40, 44, 62, 72, 73, 96, 98, 104). The remaining eight campsites (sites 17, 31, 41, 42, 63, 65, 75, 88) are located within a cost distance of 580 from the best pasture areas. All of the eight campsites that are not found directly within areas of highest NDVI are sites that were identified as "pre-modern" on the basis of their taphonomy.

The distribution of isolated corrals also shows general proximity to pasture, but less strongly than the campsites. Only two out of eleven of the corrals (18.18%) are located within the best pasture areas (sites 15, 53). The remaining nine corrals are located outside of the best pasture areas, at cost distances of up to 2415 from these areas. These observations support the

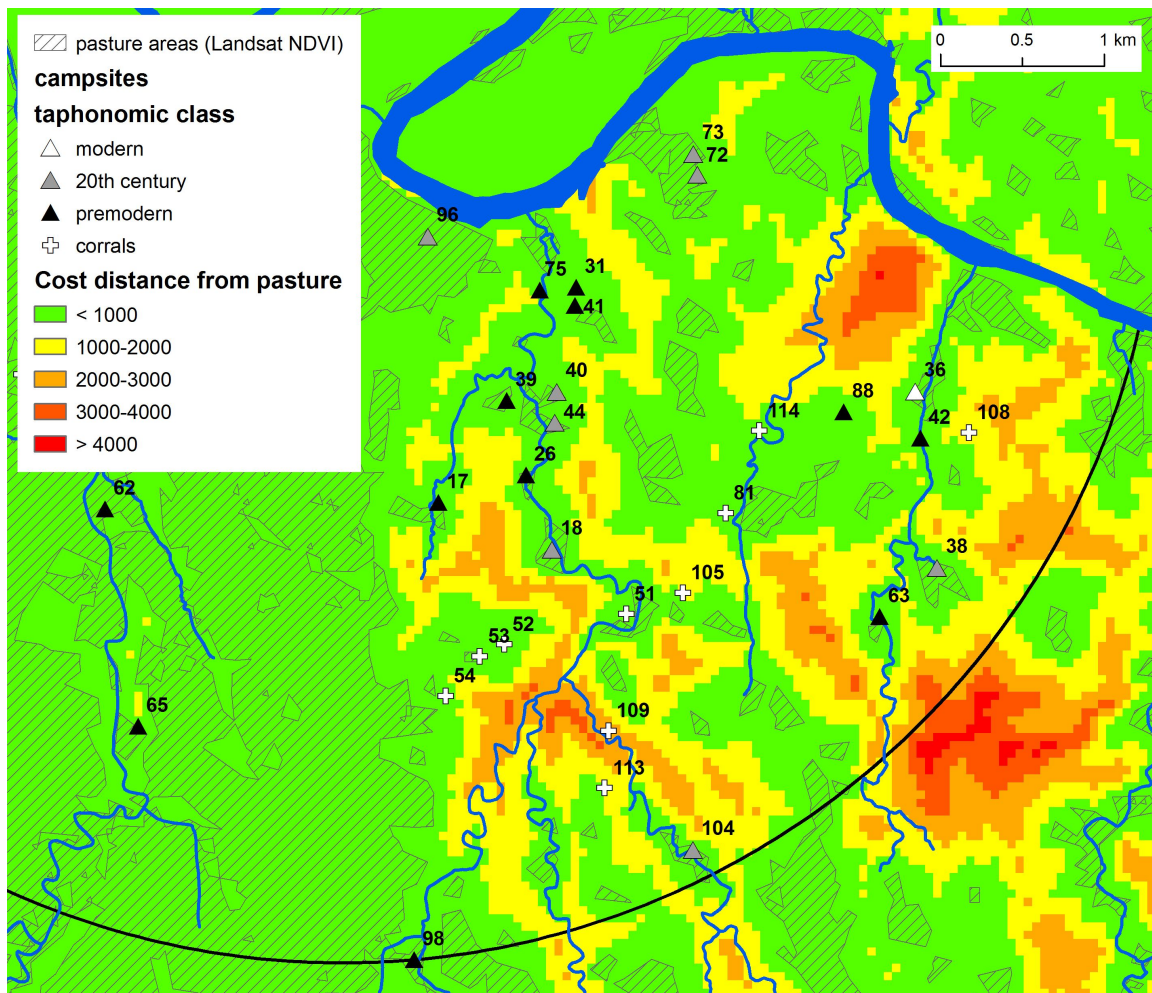


Figure 7.13: Cost distance from all hypothetical best herding areas (areas with highest average NDVI larger than 0.35 hectare) compared to campsite and corral locations.

hypothesis that isolated corrals are indicative of herding patterns and were positioned to assist herders in taking advantage of these pasture areas. If corrals were placed within areas of densest uncultivated vegetation, the herd traffic caused by the use of the corral might result in the trampling of that vegetation and the deterioration of the plant and soil environments surrounding it. The choice to place corrals nearby instead of within pasture areas could have been a deliberate land-use principle helping herders to conserve these pasture areas.

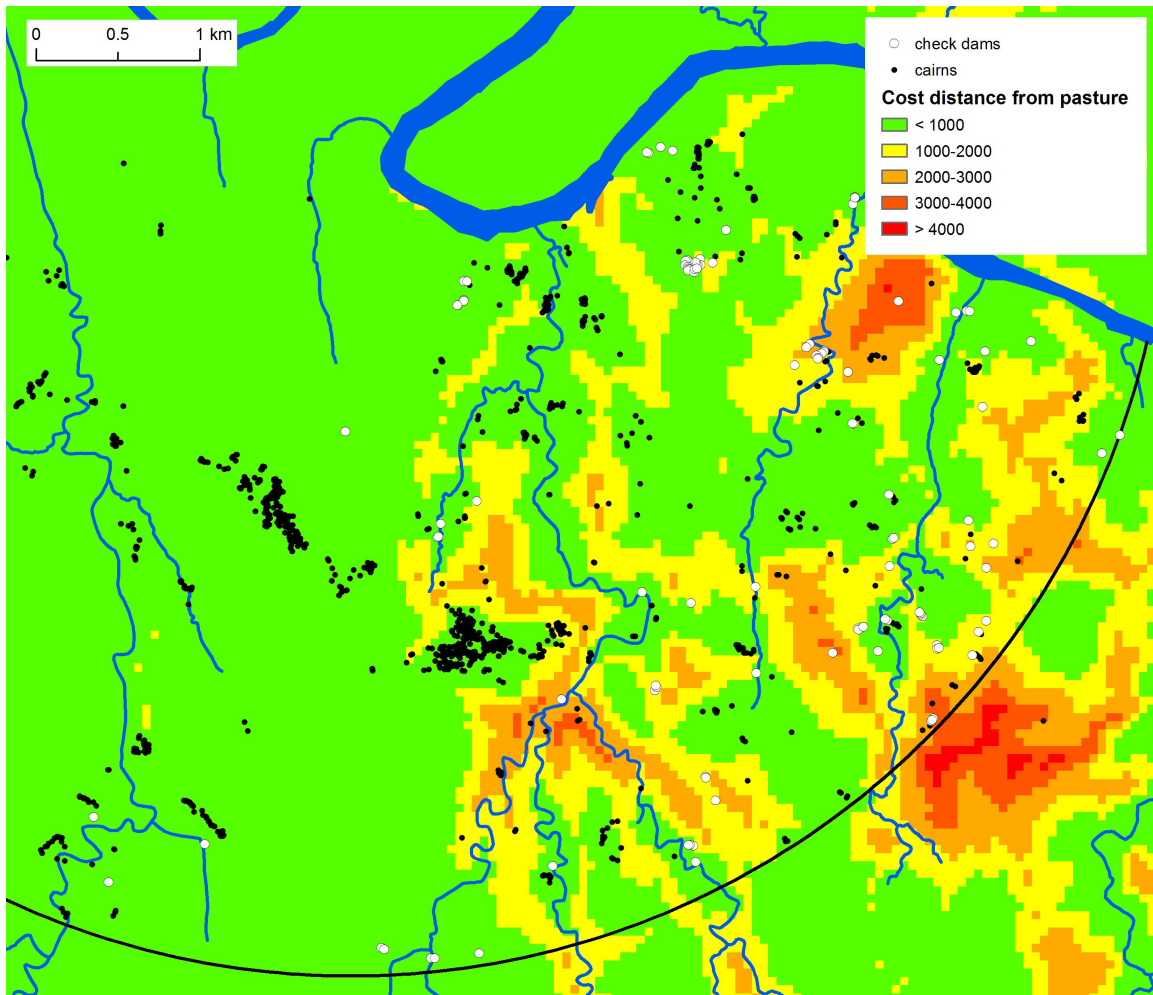


Figure 7.14: Cost distance from hypothetical best herding areas (areas with highest average NDVI larger than 0.35 hectares) compared to check dam and cairn locations.

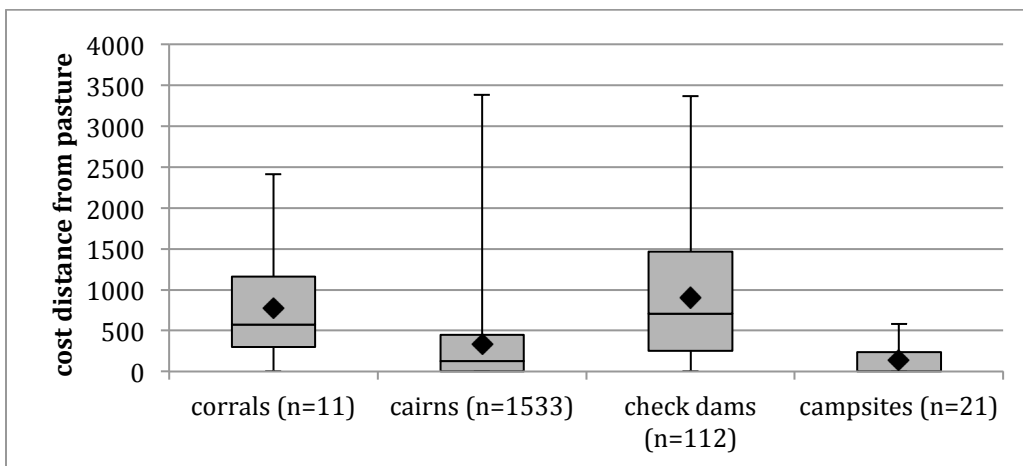


Figure 7.15: Box and whisker plot of cost distance from best pasture areas; comparison of corrals, cairns, check dams, and campsites.

In conclusion, some empirical generalizations about campsite and corral locations are possible. All 21 campsites and 8 of 11 isolated corrals are located in direct or moderate proximity to pasture areas (at a cost distance of 1000 or less from these pasture areas). Conversely, campsites and corrals generally avoid locations that are distant from pasture areas; with the exception of one corral (site 109, cost distance value of 2415 from pasture areas), none of these features was located at a cost distance of more than 1440 from the best pasture areas. Together, these observations suggest that these features' locations were oriented toward effectively exploiting the herding resources of the upland region. Inhabitation and herding patterns were ordered activities with a spatial logic, and pastoral nomadic groups in the region had enough control over the local landscape that they were able to best position themselves in relationship to the uncultivated vegetation resources.

The spatial relationship between pasture areas and potential pasture improvement systems, in the forms of dams and cairns, is more ambiguous. The average cost distance from pasture areas is 333 for cairns and 903 for check dams. In the eastern survey region, 111 of 858 of cairns (12.94%) and 22 of 112 check dams (19.64%) are located within the pasture polygons (Figure 7.15). The majority of cairns and check dams are located in areas with a cost distance of less than 1000 from the best pasture areas, but there still are significant groups of cairns located in areas with cost distances up to 3400 from pasture areas (Figures 7.14 and 7.15).

These complicated relationships could result from a number of different, non-exclusive situations. Both check dams and especially cairns have a number of potential agricultural and pastoral functions. Check dams increase soil accumulation and soil humidity in ways that are beneficial both for crops and for uncultivated vegetation growth, and cairns improve crop and uncultivated vegetation growth by removing stones from the soil (Bruins 1986; Chang and Koster 1986; Evenari, et al. 1982). Alternatively, cairns may mark graves and territorial boundaries, or might serve other ritual purposes (e.g., Bradbury and Philip 2011; Zohar 1992).

Unfortunately it is not possible to establish the function or functions of the cairn fields. In Syria, a range of cairn forms and elaborations could be divided into those likely to represent graves or monuments and those likely to represent clearance (Bradbury and Philip 2011). Most of the cairns in the HMTS area, however, had a simple circular or oval mounded form. The range of potential dates and functions might be responsible for the lack of clear spatial patterning between cairns and check dams on one hand and pasture areas on the other. On the basis of a comparison between cairns and check dam locations and the average Landsat NDVI raster, it seems that the cairns and check dams were improving the vegetation in moderate ways that did not raise NDVI values to the highest levels; the distribution of average Landsat NDVI values at both cairns and check dams is not statistically different from the distribution of average Landsat NDVI values at both cisterns and caves, which are typically located in rocky areas with limited amounts of vegetation (Figure 7.16). This conclusion was not due only to the coarse resolution of the Landsat images, as there is also no statistical difference between the distribution of high-resolution IKONOS NDVI values at cairns, check dams, cisterns, and caves (Figure 7.17).

If some cairns and check dams were created to improve the herding resources of the area, a second possible explanation for the spatial distribution lies in the conception of which pastures needed to be improved. Cairns and check dams could have been intended not as ways of improving the pasture areas that were naturally the best, but instead as ways of improving marginal pasture areas, either because they were close to the campsite or because their productivity was particularly low.

A third and final possibility is one that always must be considered in archaeological investigations: that the recovered pattern is for some reason not representative of the past situation. Check dams are difficult to spot, even with intensive survey methodologies such as those employed by the HMTS. It is thus possible that the survey team missed a substantial portion of these features, and that the mapped pattern is not representative. It is possible that the distribution of cairns and check dams was related to settlements or campsites beyond the

survey area, either on the opposite side of the Tigris or outside of the eastern and southern boundaries.

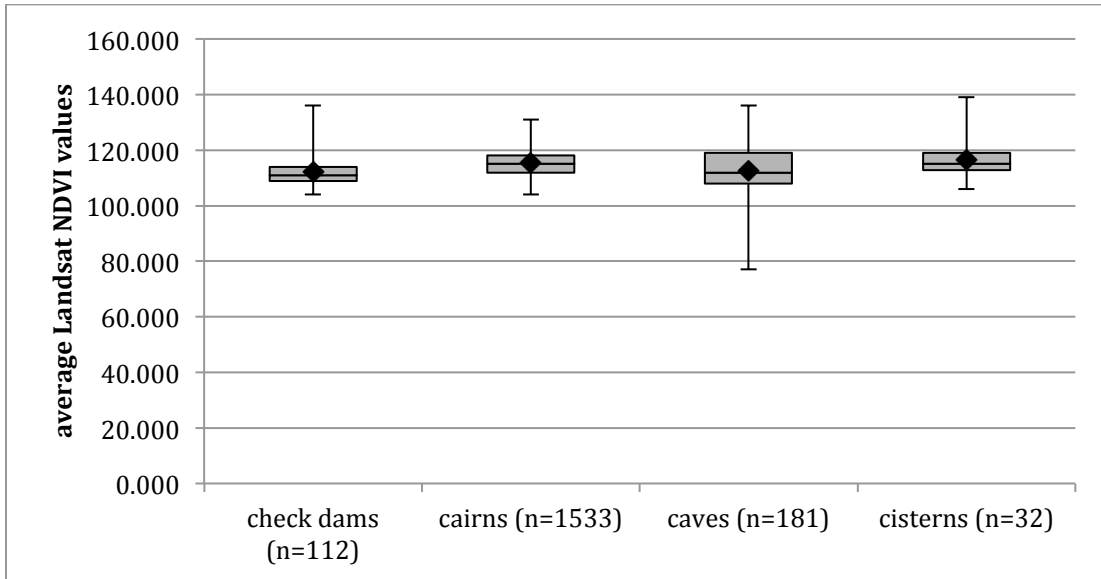


Figure 7.16: Box and whisker plot of average Landsat NDVI values; comparison of check dams, cairns, caves, and cisterns.

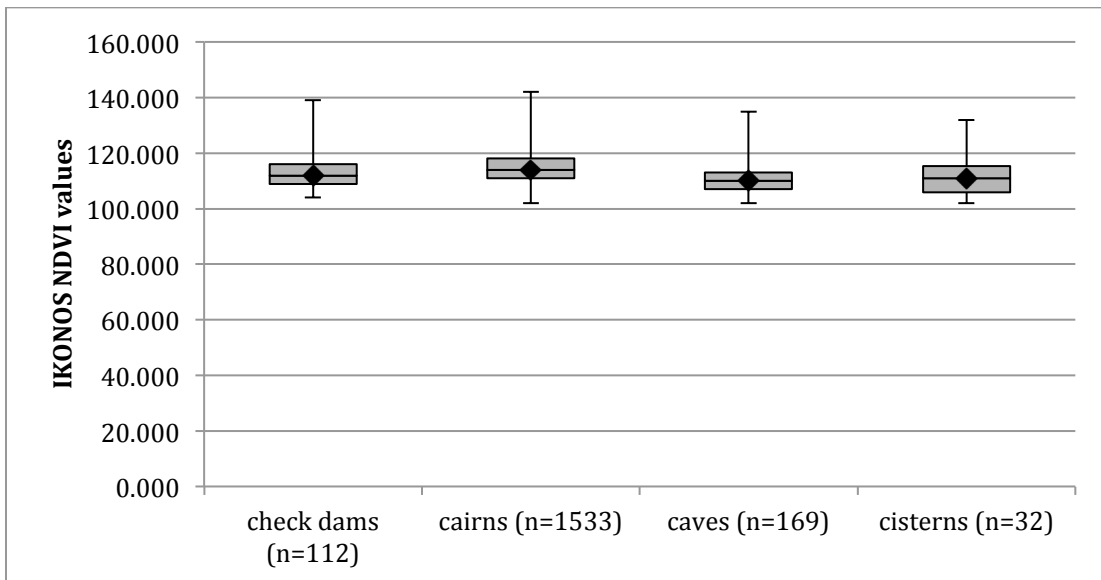


Figure 7.17: Box and whisker plot of IKONOS NDVI values; comparison of check dams, cairns, caves, and cisterns.

Organization of the Pastoral Landscape

The second group of proximity analyses investigated the spatial relationships between the various classes of surveyed features themselves.

Campsites and Reinhabitation

With so many campsites in such a small area, the question immediately rises as to how many of these sites could have been inhabited at one time. The answer to this question must in turn be related to the size of the area needed to sustain the animals of a particular camping group. Ethnographies of nomadic tribes in Turkey do not describe the size of pasture areas required by individual herds or camps, but some relevant information is available from Iran. In upland parts of Iran, agropastoral villagers herded sheep and goat up to 3 kilometers away from their villages in a single day (Watson 1979: 98-104). The villagers inhabiting winter herding stations elsewhere in Iran herded sheep and goat up to 4 kilometers away from these stations (Horne 1980: 14; 1994: 42-43, 62-65). The winter estate of a single Shahsevan camping/herding group in northwestern Iran was a circle of up to eight kilometers radius around the camp (Tapper 1979a: 107). Among the Qermezi Qashqā'i pastoral nomads of southwest Iran, some households camped half a kilometer or more apart but herded their animals together (Beck 1991). In general, pasture requirements depend on the size of the herd, the amounts of feed used supplement the herds' grazing, and seasonal rain and vegetation.

The distribution of campsites within the HMTS area should be viewed as a palimpsest of possibly uncoordinated and temporally discontinuous camping patterns rather than as a contemporaneous settlement distribution. The eastern half of the study area is only five kilometers across at its greatest extent and contains only 162 hectares of pasture. It is therefore possible that only one of the surveyed campsites was inhabited at a time. Clusters of campsites defined via cost distance from their locations (in the black ovals in Figure 7.18) consist of campsites with different morphologies and taphonomic characteristics. These clusters should

probably be viewed as evidence for reinhabitation in that area, and probably also as occasions to re-use the landscape features in the vicinity.

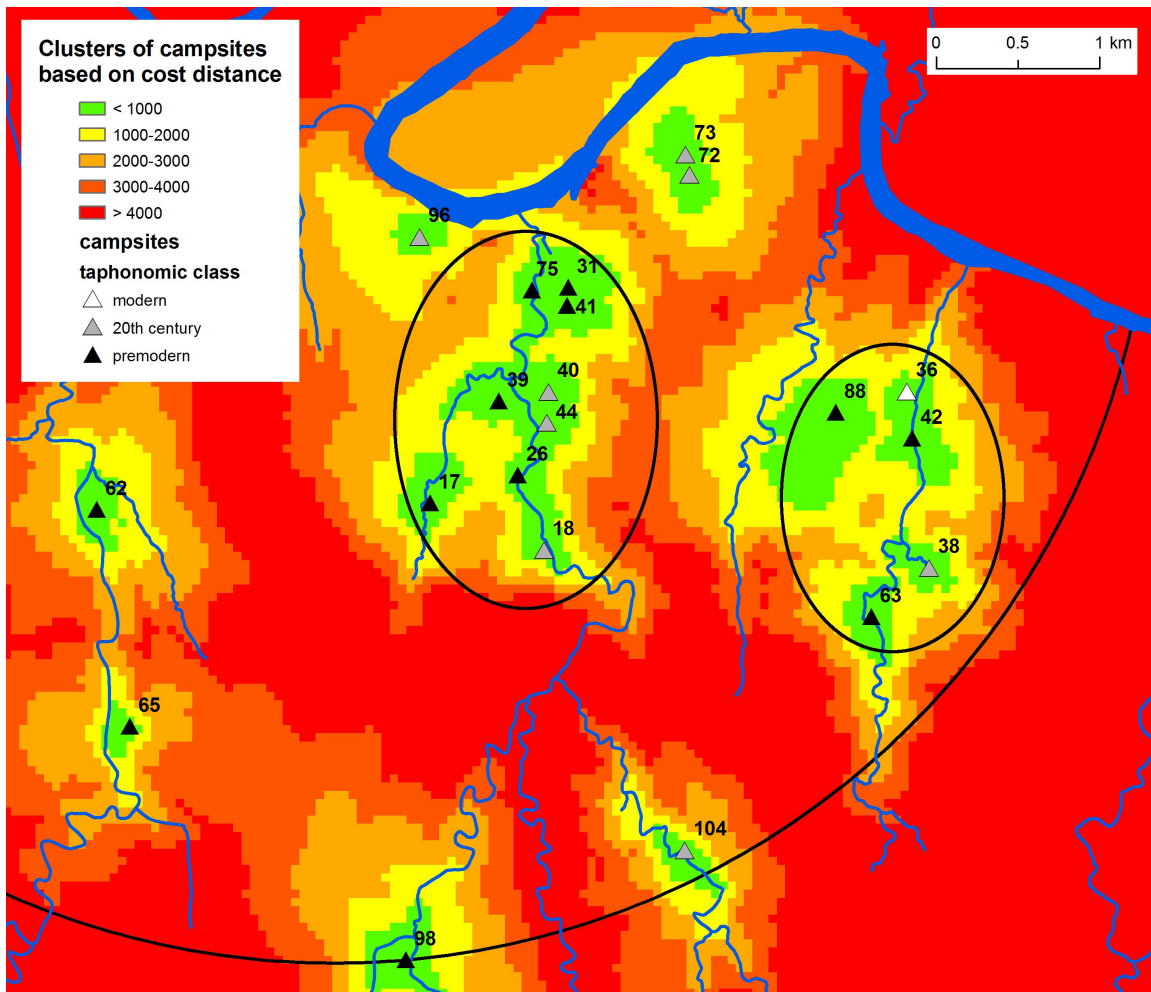


Figure 7.18: Clusters of campsites defined according to cost distance from their locations.

Campsite clusters may be related to intra- or inter-annual campsite shifts such as those documented in the ethnographies discussed in Chapter 2. Groups such as the Qermezi Qashqā'i often shifted their campsites within their winter pasture areas, sometimes only a short distance (e.g., Beck 1991). The reasons included getting away from trash accumulations, deteriorating pasture quality and availability, the terms of pasture rental agreements, and the availability of better locations as relationships between pastoral and agricultural groups or between two pastoral groups changed or as agricultural seasons ended. The deteriorating state of local resources and

collapsing campsite fixtures resulted in campsite location shifts for the Shahsevan of Iran every 15-20 years (Tapper 1979c: 86) and for the Beritanlı of southeastern Turkey every 3-7 years (Skogseid 1993: 230). Furthermore, pastoral groups did not always choose the same campsite locations from year to year. If Yörük groups did not own their winter pasture areas, they might change their winter camping locations depending on pasture rental prices (e.g., Bates 1973). Regardless of whether or not groups owned their pasture areas, they might choose to rotate campsites to avoid stressing the environment and to allow for vegetation regrowth.

Campsite and pasture rotation would be particularly important in areas with more sparse vegetation and thin soils such as the HMTS' eastern uplands, and the recent inhabitation history of the region suggests it was undertaken. Between 2008 and 2011, the modern campsite (Site 36) was inhabited only in the winters of 2008 and 2011. During other years the pastoral families must have camped and herded their animals elsewhere.

The archaeological presence of multiple campsites in multiple clusters could also be due to the particular history of agricultural land-use in the region. The shifting location of agricultural fields in the upland area would have changed which areas were open for pastoral land use. Several different groups with different affiliations (either different tribes, subtribes, or camping groups) could have been using the general region for winter pasture, and perhaps these groups did not use the campsites and landscape features of each other. In the twentieth century, the Hirbemerdon Tepe area was located at or near the interface of the Beritanlı tribe's winter camping area with that of the Alikanlı tribe (see Chapters 2 and 4), so the possibility of various campsites being inhabited by groups with different affiliations is high.

Distance and Proximity Among the Classes of Sites Identified

Campsites were the focal point of pastoral activity and human and animal movement. An assessment of what types of landscape anchors are closest to them is therefore an important part of assessing the nature of local landscapes (Figure 7.19). Box and whisker plots show the

distribution of cost distance value from campsites for each feature class (Figure 7.20). With the exception of individual cairns and check dams, modified caves and cisterns are the features classes that are generally most proximate to campsites. Dense cairn fields and corrals without associated camping areas are the least likely feature classes to be found in close proximity to campsites.

Whereas campsites are obviously indicative of inhabitation patterns, isolated corrals may be indicative of herding patterns. The isolation of corrals without associated camping areas is also confirmed by examining their cost distance from campsites (Figure 7.19). Of the 11 surveyed isolated corrals, none are within close proximity to campsites (cost distance of less than 1000), and only two fall within moderate proximity to campsites (cost distance of less than 2000; sites 108, 114). Furthermore, five corrals are found in locations that are as far as one can possibly be from any campsite in the survey area (cost distance greater than 4000). As was already discussed above, the corrals are proximate to some of the largest tracts of land with high average NDVI values; perhaps the corrals were positioned to assist herders in taking advantage of these pasture areas. These isolated corrals would have allowed herds to be kept overnight near the pasture areas while being protected from predators.

Cairns and check dams are sometimes found in spatial association with the isolated corrals. Some clusters of these features are located in close proximity to the corrals (Figure 7.21). Most notably, three corrals are located at the edges of the large cairn field at site 53.

The central role of cisterns emerges repeatedly in the distribution of campsites. Their continued use is highlighted by evidence for their maintenance (in the form of spoil heaps), and particularly their spatial locations. Ten of the thirty-five cisterns (28.57%) are located proximate (within a cost distance of 1000 or less) to five out of the twenty-one campsites (Figure 7.22). One

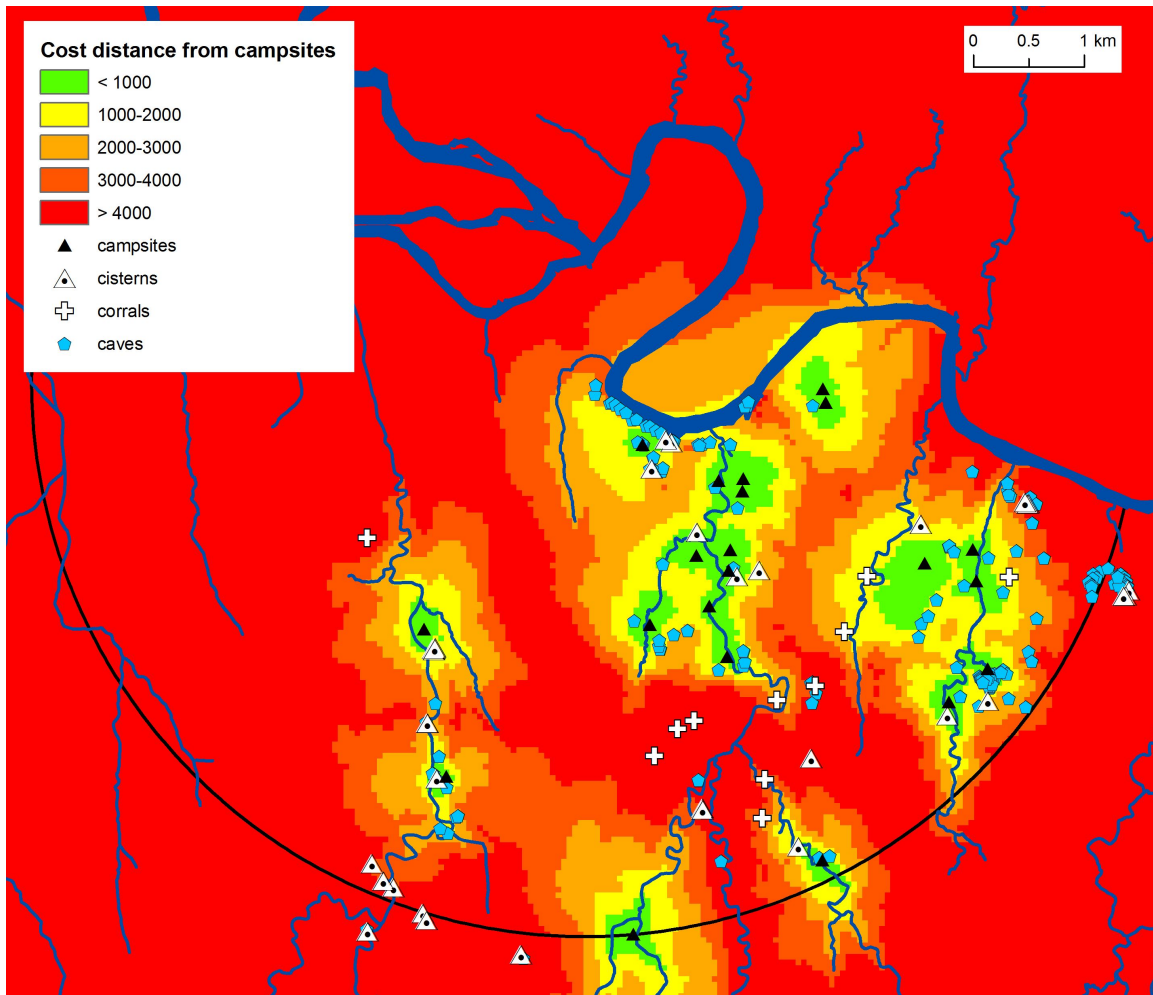


Figure 7.19: Cost distance from all campsites compared to corral, cistern, and cave locations.

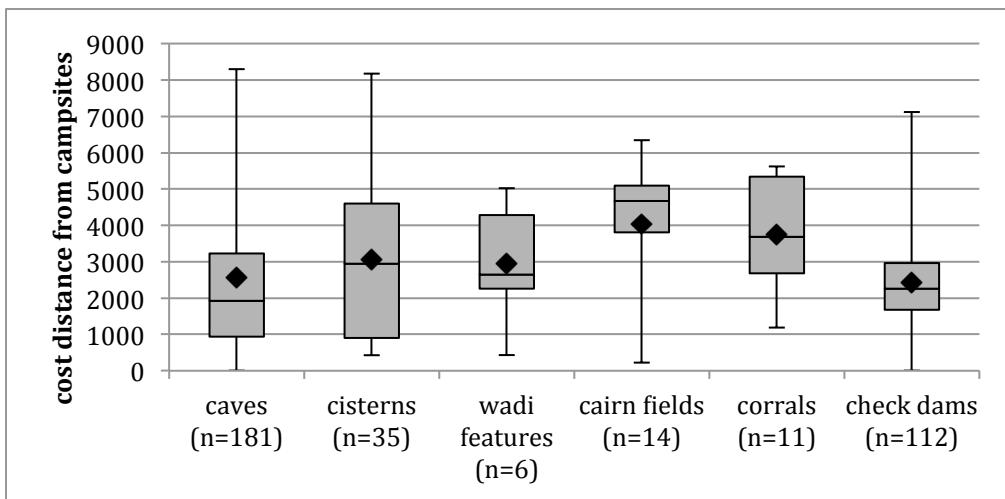


Figure 7.20: Box and whisker plot of cost distance from all campsites; comparison of caves, cisterns, wadi features, cairn fields, corrals, and check dams.

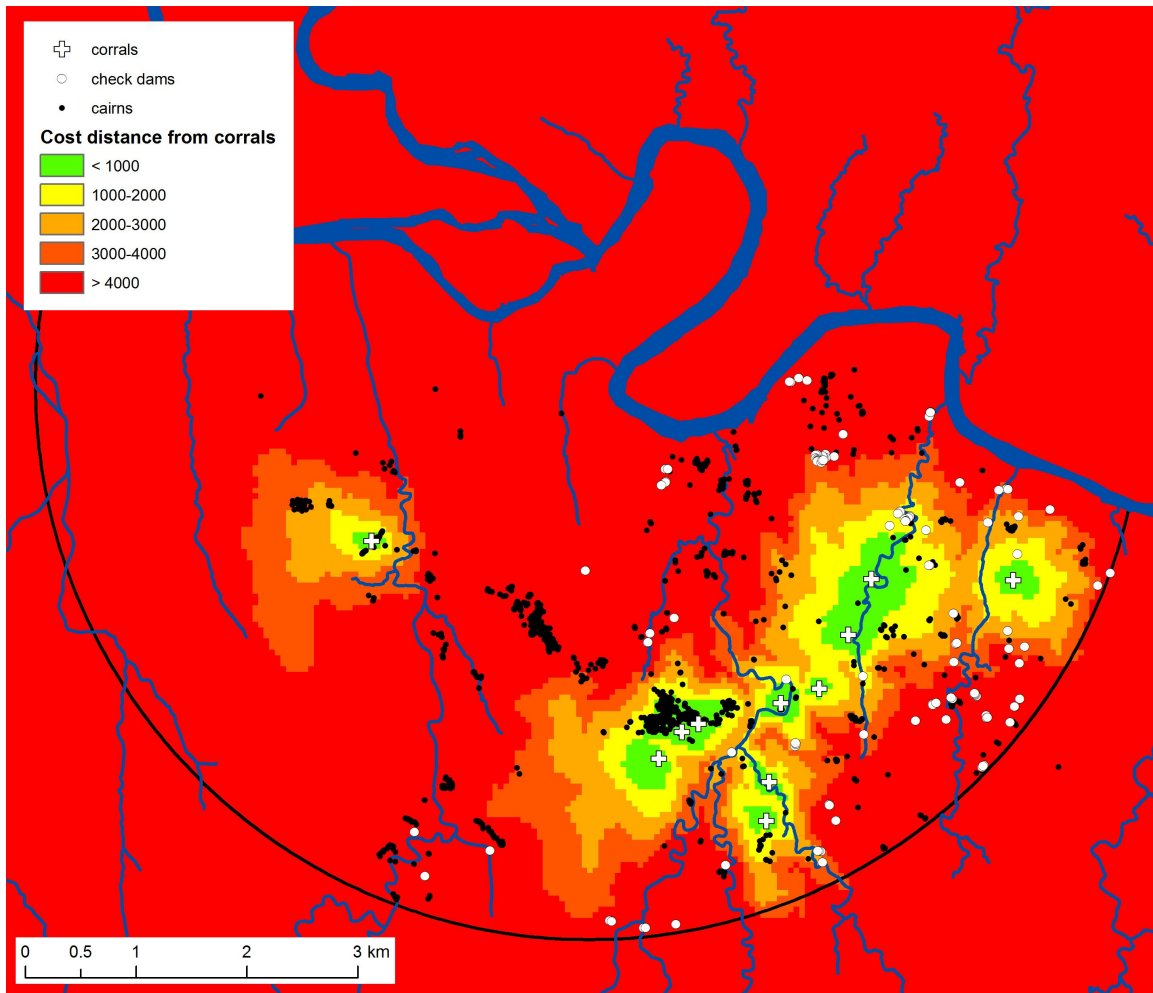


Figure 7.21: Cost distance from all corrals compared to the distribution of cairns and check dams.

of the few campsites not located near cisterns is the modern campsite (Site 36). According to local villagers, the group inhabiting this campsite trucked in water for themselves and their animals. They did not use the cisterns, and did not need to consider the locations of cisterns when choosing the location for their campsite.

Older campsites cluster around larger cisterns. In the western-most drainage of the eastern uplands, the densest concentration of campsites in the survey region (six campsites), is situated in direct proximity to a cluster of three cisterns (Figure 7.23). Three of the six campsites (sites 39, 40, and 44) are set in the middle of the cluster of three cisterns (sites 45, 47, 67). These campsites have different morphological characteristics. Only one campsite probably would have

been inhabited in a particular season, so this archaeological pattern probably results from the repeated reoccupation of a location because of the advantages provided by the nearby cisterns. The cistern cluster was a capital investment that may have oriented subsequent re-inhabitation. Radiometric and/or stylistic dates for the campsites and surrounding landscape features could support this assessment, but for the moment, it must remain a hypothesis.

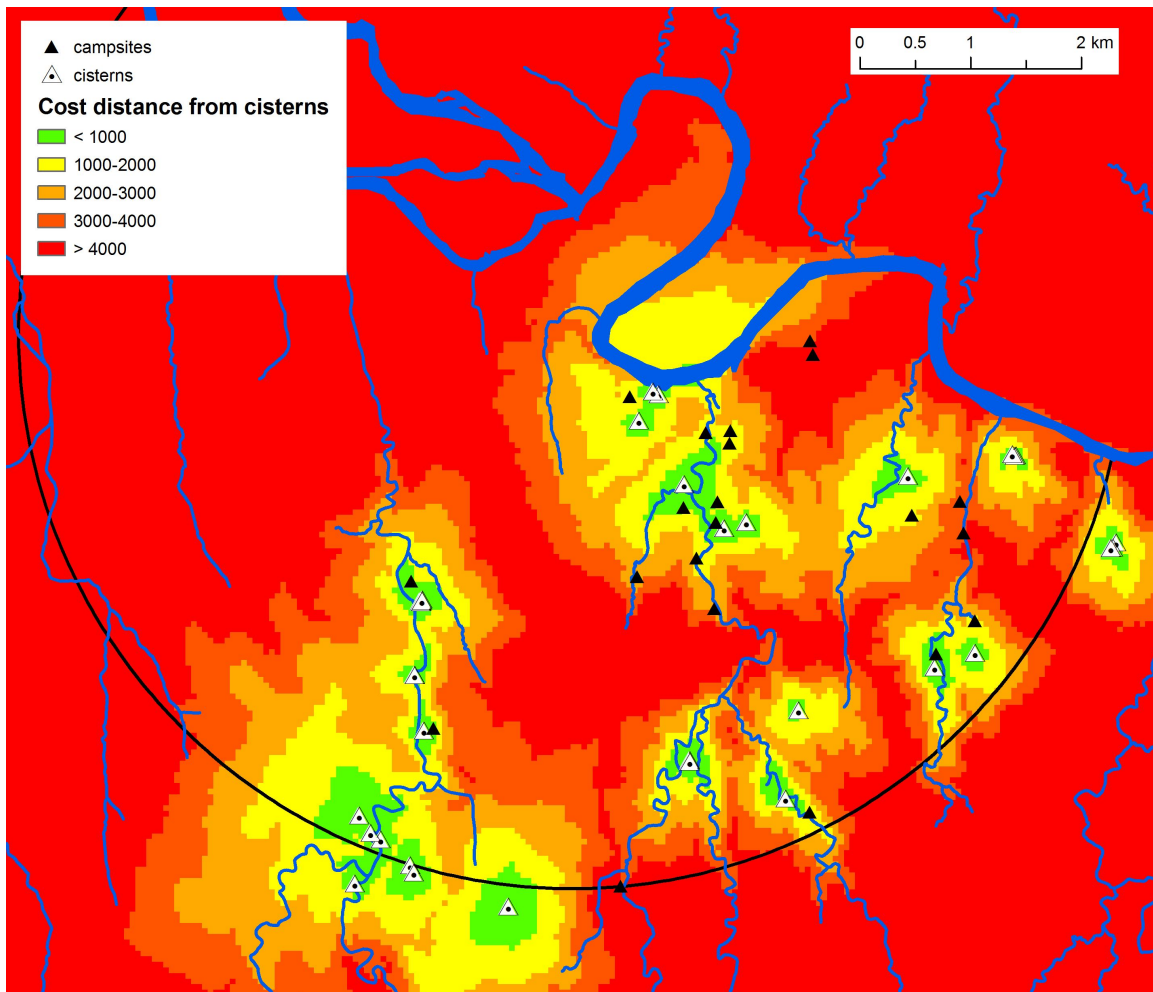


Figure 7.22: Cost distance from cisterns compared to the distribution of campsites.

The volume of the cisterns in comparison with sheep water needs suggests that the cisterns fulfilled household water needs rather than those of animals. Awassi sheep require on average 3-4 liters per day in winter, depending on their age, size, condition, and reproductive

state (Alamer 2011). Average herd size over the last several centuries has typically been around 300 sheep/household (Chapter 4), making each household's animal water requirements 900-1200 liters per day. A small camping group of 3-4 families would require 2700-4800 liters per day. The cisterns' volumes range from 1000-16000 liters (Chapter 6), with most cisterns probably holding a fraction of their volume at any given time. The modest size of the cisterns made them better suited for household water consumption. Animals must move throughout the day to graze, and can be easily taken to the river to drink as part of a daily round. However, many of the campsites are located a kilometer or more from the river, and household water needs are not so easily met with a distant water source. Cisterns collect clean water for household activities. The cisterns density in the HMTS area is unrelated to distance from the river (Figures 7.24 and 7.25). This suggests that even campsites located close to the river may have preferred to obtain their household water from cisterns, possibly both for reasons of convenience and purity.

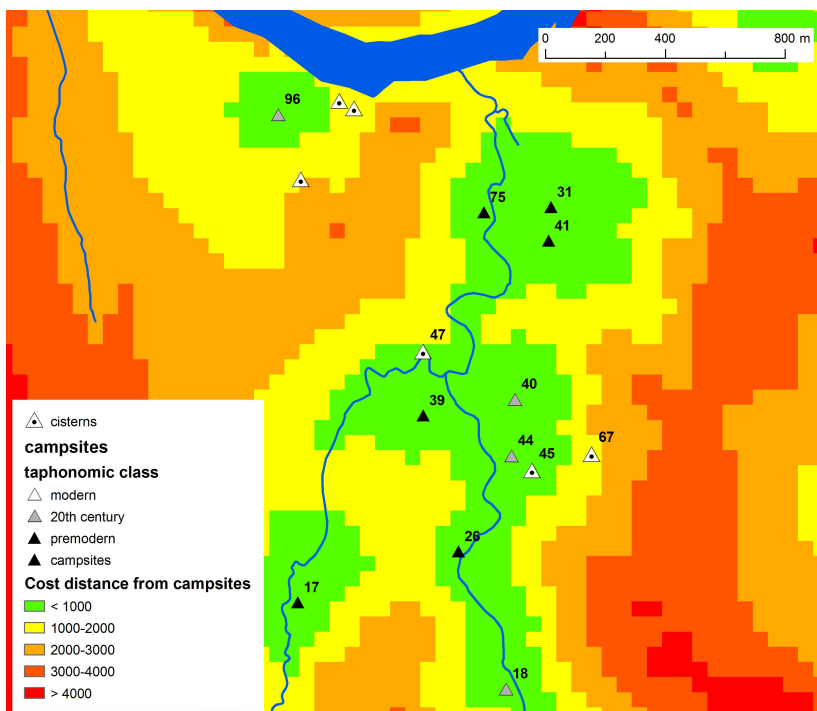


Figure 7.23: The spatial clustering of cisterns and campsites around each other, shown using cost distance from campsites.

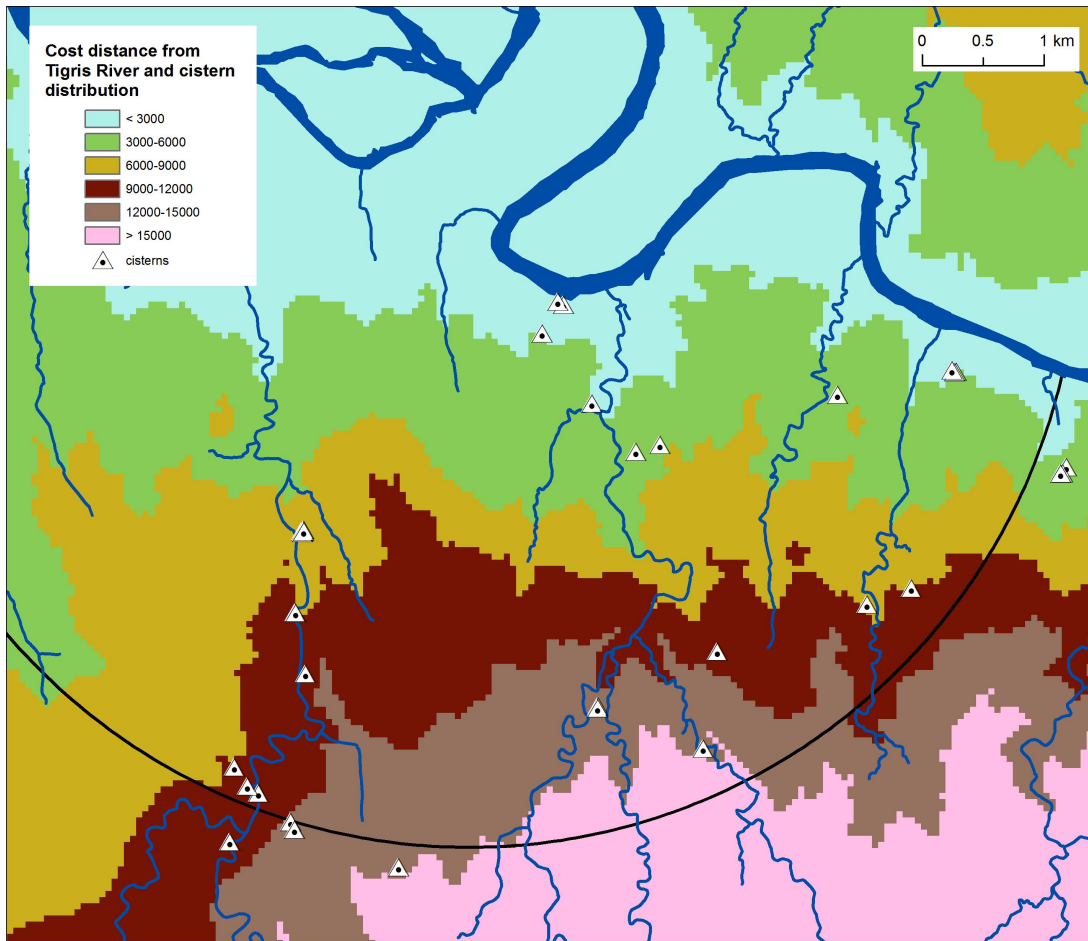


Figure 7.24: Cost distance from the Tigris River compared to the distribution of cisterns. The color scheme is changed from other cost surfaces in the figures of this chapter to highlight that a different scale is used in this figure.

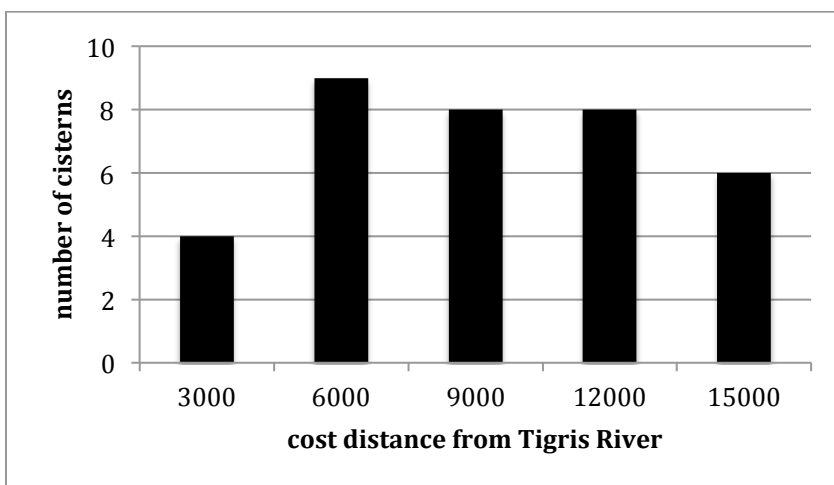


Figure 7.25: Histogram showing that the number of cisterns in the study region does not significantly change with increased distance from the river.

The spatial importance of constructed water features for winter campsites is unsurprising, given the ethnographic literature discussed in Chapter 2. Winter water availability was the most common problem among the Qermezi Qashqā'i in Iran (Beck 1991) and the Beritanlı in southeastern Turkey (Skogseid 1993). Among the Qermezi Qashqā'i, the most significant landscape investments made in winter camping areas and the only landscape investments made in summer camping areas related to water collection. For many groups, the water and pasture resources available in winter territories formed the primary constraint on the entire regional transhumance system (Barth 1959: 8; Bates 1973: 129, 218; Cribb 1991b: 135). Improvements to the water availability in winter territories could have had year-long effects on human and animal demography by increasing the carrying capacity of these winter territories.

Islamic notions of water rights dictate that free-flowing water (e.g., rivers and springs) cannot be owned but that modified or improved water sources are private property (Canan 1995; Shankland 1999). These ideas have likely been a force in southeast Anatolian land-use patterns over the last millennium. The pastoral tribes in the Ottoman period in the Diyarbakir area were Muslim, although Christian groups lived very nearby, especially in the Assyrian Christian heartland of the Midyat area (see Chapter 3). Pastoral nomadic investment in cisterns could either lead to or result from seasonal control over herding and camping areas. As was already discussed in Chapter 2, the degree of security in pasture tenure in the ethnographic literature correlated with the degree of effort invested in campsite fixtures and landscape improvements.

Vertical Organization of the Landscape/Zoning

The positions of landscape anchors with respect to each other and topography suggests that there may have been a vertical organization of the local landscape into lower inhabitation areas and higher herding areas. A simple comparison of feature elevations does not show this division, as there is a gradual but significant increase in the elevation of the lowest points in the drainage beds as one moves away from the river. A better and quantitative way to show this

division compares feature locations to their cost distance from seasonal drainages (Figures 7.26 and 7.27). Most inhabitation features—campsites, modified caves, cisterns, and possibly also wadi water retention features—are located at topographically low points in the landscape, immediately adjacent to the seasonal drainages. The features associated with herding patterns—corrals and potentially also cairns and check dams—are more evenly spread across the topographic zones and frequently may be located at topographically higher points in the landscapes, on the plateaus and ridges above (and more distant from) the seasonal drainages.

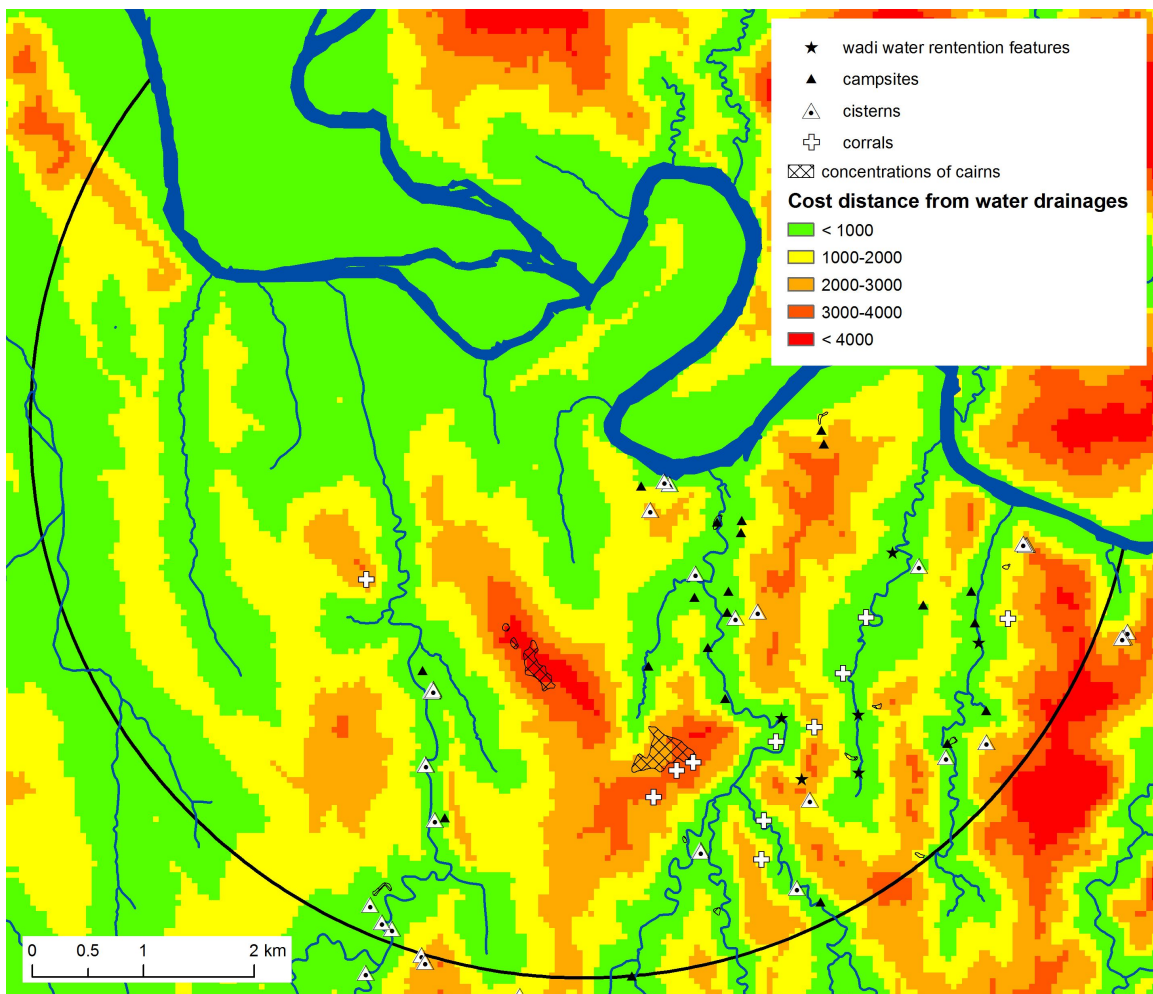


Figure 7.26: Cost distance from seasonal water drainages compared to the distribution of campsites, cisterns, corrals, cairn fields, and wadi water retention features. This shows a vertical division of the landscape into topographically lower camping areas and topographically higher herding areas.

A non-spatial analysis of the raw cost-distance-from-wadi values allows a more quantitative assessment of the nuances in this general spatial division. This raw cost-distance value was extracted for each feature location, and a frequency histogram was generated for each class of features (Figure 7.28). The bars on the graph represent the percentage of that feature class (the y-axis) that had cost distance values in a given distance range (the x-axis). All zones of the landscape were used for pastoral activities. Caves, campsites, and wadi features cluster in areas

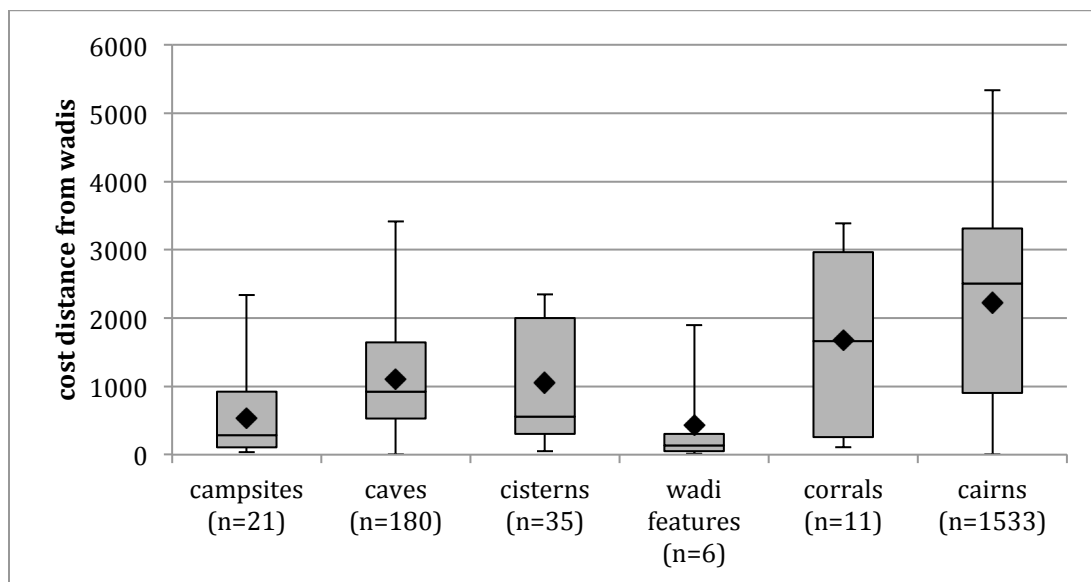


Figure 7.27: Box and whisker plot of cost distance from seasonal drainages; comparison of campsites, caves, cistern, wadi water retention features, corrals, and cairns.

adjacent to the seasonal drainages. Cairns are distributed evenly across the landscape but can be found further from seasonal drainages (and thus at higher relative topographic heights) than any of the other classes of features. Corrals and cisterns have binomial distributions.

Inhabitation features tend to cluster in the lowest part of the landscape and features related to herding and pasture are found in higher points in the landscape. This organization of the landscape would have necessitated daily vertical movement for both people and animals between topographically lower and topographically higher areas. Ethnographically-studied

pastoral nomadic groups tended to position their winter campsites in areas that were naturally protected from the wind. In a topographically uneven landscape such as the HMTS' eastern uplands, such protected areas are typically local topographic lowpoints. In an uneven winter camping landscape, we might expect to find a vertical division of the landscape into inhabitation and herding areas similar to that seen in the HMTS area.

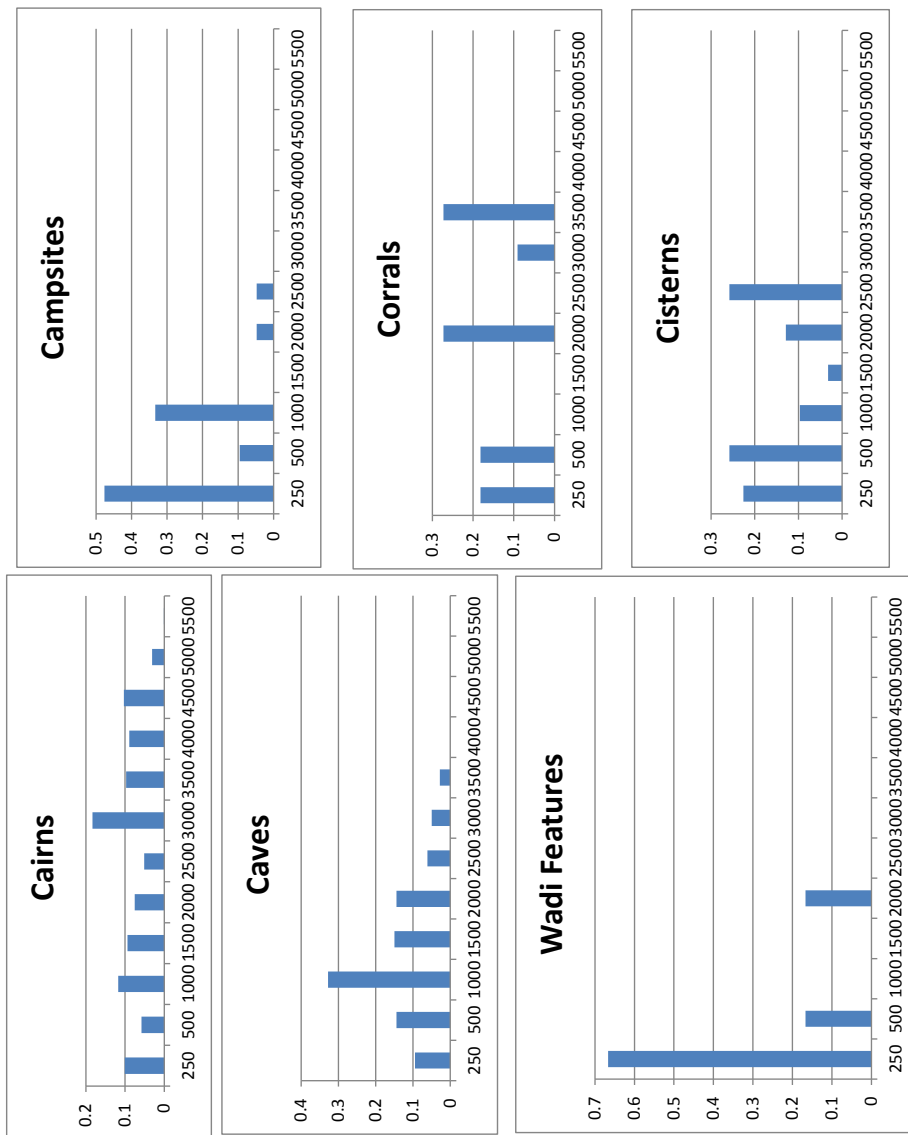


Figure 7.28: Histograms showing the distribution of features at relative topographic heights above the seasonal drainages.

Conclusion

At the eastern edge of the Upper Tigris River Valley, sites and features related to seasonal pastoral inhabitation are frequently related to each other and to the environment in patterned ways. These patterns are related to the features' function and use. The relative isolation of corrals from other archaeological sites and features, demonstrated through cost distance measures, strongly suggests that they were located to assist herders in taking advantage of pastures that were further away from campsites. The spatial association of campsites and corrals with areas of high average NDVI values demonstrates that the location of both camping and herding activities was oriented to the quality and quantity of non-cultivated vegetation. Corrals are located near but not within areas of highest NDVI values, possibly so that that repeated animal traffic did not trample the vegetation within the best pasture areas.

Ethnographic accounts of pasture orbit sizes suggest that the study area may only have been large enough to support one campsite at a time. The distribution of campsites is therefore probably the result of multiple seasonal re-inhabitations. Clusters of campsites sometimes occur around clusters of cisterns, which acted to encourage the seasonal re-inhabitation of certain areas.

Of all of the classes of features and sites surveyed, rock-carved cisterns and constructed cave structures most clearly fit the criteria used to define "landscape anchors." The spoil heaps and talus slopes in front of cisterns and caves suggest long-term maintenance and re-use. Twenty-one out of the twenty-one campsites are within a cost distance of 2000 from either of these types of features (all except site 98), and thirteen of the twenty-one campsites are within a cost distance of 2000 from both cisterns and caves.

Comparison between the modern campsite (site 36) and the earlier campsites in the HMTS region shows that the value of pastoral landscape anchors is changing. Earlier campsites were sensitive to water and pasture improvement features. The modern campsite in this area is

not placed with regard for the position of cisterns, perhaps because vehicles are used to transport water and feed to the campsite.

The pastoral nomadic world of the eastern HMTS region was vertically divided. There was a topographical division between lower pastoral inhabitation areas and higher herding areas. Moving between these zones would have required a daily vertical movement pattern for animals and herders.

All of these observations about site and feature location represent a first step towards an empirical understanding of pastoral land-use, daily activities, and conceptions of space in the past.

CHAPTER 8: CONCLUSION: LANDSCAPES OF PASTORAL NOMADS

This study has reviewed evidence for pastoral nomadic landscapes in southeastern Turkey over the last 500 years. Its results force a reassessment of several widely-held assumptions about these landscapes and their archaeological visibility. Pastoral nomadic groups are indeed visible in the archaeological record under certain landscape conditions. Moreover, we can study various scales of their mobility by combining archaeology with historical census records, ethnography, and environmental data. Intensive field surveys of areas outside of the boundaries of modern-day agriculture can produce data on pastoral landscapes of the past, providing archaeologists with tools for empirically documenting diachronic change and variation in mobile pastoral land-use.

This concluding chapter integrates archaeological, ethnographic, and historical data to identify the elements of local pastoral nomadic landscapes and to reconstruct the organization of these landscapes and the daily activities that took place within them. Over time, landscape anchors—fixed features that improve the pastoral potential of a particular area—become geographical foci for seasonal re-inhabitation. In this manner, they play a significant role in the long-term spatial structure of local landscapes. The issues of landscape organization, quotidian activities, and landscape anchors return us to the broader aims of this research: to examine the ways in which mobile pastoral societies transformed the landscape, and in doing so, reconstruct history from the viewpoint of mobile pastoralists themselves.

In order to recover evidence of pastoral nomadic activity in the past, the Hirbemerdon Tepe project intensively surveyed upland areas at the edge of the Upper Tigris River Plain in Diyarbakır Province, Turkey. Via pedestrian transects, the survey team located campsites and surrounding landscape features. Spatial data were entered directly into a geospatial database using a handheld computer/GPS for later GIS analysis. All of these groundwork-based

undertakings were partially directed by several types of satellite data. Vegetation analyses of multispectral satellite imagery identified ideal pasture areas, digital topographic models were used to assess the relative proximity between various classes of features and sites, and satellite photographs were used to map campsites located outside of the survey area. Interpretation was further enhanced by a close reading of ethnographies on pastoral nomads and “village inventories” conducted by the Turkish Republic in rural areas before the introduction of mechanized agriculture. Ottoman administrative documents were used to trace the changing boundaries between agricultural fields and pasture land in the study area over the last 500 years and to discuss regional transhumance patterns that could not be recovered by an intensive archaeological survey.

The major conclusions can be grouped into three general categories: the varieties of individual landscape features, their organization into local pastoral nomadic landscapes, and the utility of new archaeological methods of data recovery and analysis.

Elements of Pastoral Nomadic Landscapes in Southeastern Turkey

Far from being invisible, the physical remains of past seasonal encampments and pastoral activities were abundantly present in the eastern Hirbemerdon Tepe region. Four seasons of intensive field survey documented a rich landscape of pastoral campsites, animal shelters, water collection features, and pasture improvement features. The survey covered 47 square kilometers, including river terraces and surrounding steppe used in modern times for extensive agriculture in the western part of the study area as well as eroded limestone hills used in modern times for both small-scale agriculture and seasonal pastoralism in the eastern part. Some of the low-density artifact scatters in the western part of the survey area could represent former pastoral campsites that have been flattened by subsequent agricultural activity. However, the clearest data on pastoral land-use patterns come from the 16.5 square kilometer eastern part of the survey area,

where large sedentary villages and extensive, continuous field systems have not drastically transformed the ground surface.

The most visible elements were the campsites themselves, in unexpected abundance. The survey documented eighteen campsites exhibiting various degrees of preservation and different morphologies. A single modern campsite, constructed sometime after 2004 and inhabited during the winters of 2008 and 2011, consisted of packed earthen tent platforms, animal enclosures constructed of a combination of brush, stone, and nylon sacks filled with earth, and feeding troughs constructed of wicker and stone. Litter related to domestic activities and animal care covered the surface of this campsite. The campsite was organized in a modular way, with each tent platform surrounded by a similar constellation of features.

Six twentieth century campsites consisted of partially collapsed structures. The primary means of dating was the frequency of plastic and other modern materials among their surface assemblages. The most visible features of these campsites were rectangular stone enclosures that served as animal corrals and tent foundations. Differential growth of vegetation and faint stone alignments sometimes marked the locations of packed earthen tent platforms and the former locations of corrals constructed from perishable materials, where dung had changed the soil chemistry. These sites were also associated with clusters of natural and modified caves cut in the limestone bedrock. Some twentieth century campsites were organized in a modular fashion similar to the modern campsite, but others showed a different type of layout, where similar structures were grouped together. Where visible, tent entrances were oriented such that the household would have a measure of privacy.

Ten older campsites of an unknown age consisted of severely collapsed, flattened structures; these sites had no plastic or modern glass among their meager surface assemblages. Tent locations in these campsites were marked by low stone foundations and stone “bedding platforms” for storing a household’s baggage. Ethnographic studies document the use of such platforms. Vegetation, soil, and architectural differences no longer clearly distinguished tent

areas from corrals in older campsites, and without the ability to excavate, the Hirbemerdon survey team could not map the internal organization of most of these campsites.

Animal enclosures consisted of stone corrals and cave shelters, both in proximity to campsites and in isolation. Although corrals constructed of perishable materials probably existed in the past, the most archaeologically visible corrals were constructed of stone and sometimes had internal divisions. Eleven collapsed, circular-shaped stone corrals had no evidence for associated camping areas. Modified caves frequently had windows, dividing walls, doorways, feeding troughs, and hooks or loops carved into their interiors. Rockshelters frequently had stone barriers constructed across their entrances. Every reasonably accessible cave and rockshelter in the survey area showed evidence for use as an animal shelter. Large talus slopes and associated scatters of stone tools dating back to the Paleolithic suggest that many of these caves were re-used by pastoralists.

Water was a major concern for humans and animals, and the survey revealed abundant evidence for water capture and storage. Pit-style and stepped-style cisterns cut into bedrock evidenced water collection in the eastern uplands. Pit cisterns had flat openings into bell-shaped reservoirs. Stepped cisterns had a more complex morphology, with three or more stairs leading through a rectangular door into a rectilinear-shaped tank. Carved surface channels directed hillside runoff into the cistern tank. All cisterns were modest in size, ranging from approximately 1-16 cubic meters (1000-16000 liters) in volume.

The landscapes surrounding campsites are scattered with other stone features, especially check dams and cairns, that may be related to pasture improvement. Check dams typically occur in small drainages, either as single features or as series of parallel features, and impound limited amounts of soil and water. Cairns also occur singly or in small and large clusters of varying density. Both check dams and cairns are frequently associated with modern and relict field systems. Series of check dams act like terraces to improve field moisture and encourage the accumulation of soils, while cairns are the result of clearance activities that improve crop growth

by removing stones from the soil. However, these functions would also benefit the growth of natural vegetation. Water collection and pasture improvement features would have been most functional during the winter rainy season and the spring.

Because of their spatial associations with campsites and winter-seasonal functionality, the cisterns and check dams can be attributed to pastoral nomadic groups with confidence. In almost all cases, these features are associated with pastoral campsites rather than sedentary villages, which suggests that pastoralists may have created and used them. Ethnographic and historical accounts of pastoral nomadic tribes in the Upper Tigris region over the last 500 years indicate that various groups frequently used the study area as a winter camping area.

The positions of the surveyed features in regional and local space are indicative of three dimensions of movement shaping pastoral landscapes. The first dimension concerns the political region, specifically the forced regional and local mobility pastoral nomadic groups experienced as the Ottoman state shifted and reduced their pasture areas. The historical sources reviewed in Chapter 4 present a detailed picture of this dimension for southeastern Turkey and the Diyarbakır region in particular. The second dimension concerns the ecological region, that is, regional-scale transhumance associated with an annual migratory orbit between winter and summer camping areas. The ethnographies reviewed in Chapter 2 present the most detailed picture of this dimension for vertically transhumant groups in the Taurus-Zagros mountain arc. The third dimension concerns the local-scale movements undertaken by households and camping groups in a single season. The Hirbemerdon Tepe Survey data discussed in Chapters 6 and 7 present the fullest picture of this dimension. This third dimension has largely been neglected in previous historical and ethnographic research, and represents the major empirical contribution of this study.

Reconstructing Local Landscape Organization and the Role of Landscape Anchors

The identification and description of these pastoral nomadic landscape features is only an initial step. By design, the survey and subsequent analyses focused on reconstructing the local landscapes of pastoral nomads, that is, the immediate catchment areas or hinterlands surrounding pastoral campsites. Ethnographies of pastoral nomads and sedentary agropastoralists in southeastern Turkey and Iran, reviewed in Chapter 2, indicate that local landscapes of stock-raising communities are shaped by a combination of human and animal needs and the location of permanent structures and landscape features created by both pastoral and surrounding agricultural societies. More specifically, local landscapes were shaped by pasture allocation or rental agreements, location of water and pasture, spatial and social relationships with surrounding agricultural societies, and specific herding and vegetation conservation strategies. Daily movements related to herding and domestic activities frequently were both marked and shaped by features such as corrals, caves, and water basins. Ethnographies of sedentary sheep-herders in Scotland and New Zealand suggest that daily movements related to animal husbandry also demonstrate the geographic knowledge, landscape perceptions, and identity of shepherds and pastoral communities.

Landscape feature locations can be analyzed to reconstruct local pastoral landscapes, patterns of daily movements, and the factors that shaped them. Features and sites were related to one another and the environment in patterned ways. Campsites were uniformly located on the flat terraces of seasonal drainages (wadis) in areas where they were protected on one or more sides by higher topography. The spatial association of campsites and corrals with areas of densest vegetation suggests that the locations of domestic and herding activities were oriented to the quality and quantity of natural pasture. However, campsites varied significantly in their proximity to water resources—the Tigris river and the cisterns. Isolated corrals were located to assist shepherds in using pastures located further away from campsites. Corrals were located near

but not within areas of abundant vegetation, likely so that repeated animal traffic did not trample vegetation within the best pastures. The vertical differences in the positions of campsites and the positions of surrounding landscape features describes a daily movement pattern between a topographically lower inhabitation landscape in natural drainages and a topographically higher herding landscape on plateaus.

Pastoral nomads managed their environments and impacted water, vegetation, and soil resources in ways that far outlasted any seasonal visit. These environmental interventions helped groups cope with variability in the availability of natural resources. Cave pens, corrals, and fixed tent foundations were investments of labor and materials. The placement of corrals may have conserved quality pasture areas. Cisterns increased the reliability of water supplies by spatially and temporally diversifying water sources following the winter rains. Dams and cairn fields helped intensify the growth of natural pasture grasses by increasing soil humidity and soil accumulation and by reducing the number of stones in the soil.

On the basis of ethnographic research and field survey data, local pastoral nomadic landscapes were shaped by landscape anchors—permanent landscape features that enhanced natural resources over long periods of time and that shaped pastoral movement, inhabitation patterns, and daily activities. Many surveyed features and campsites were composed of permanent, fixed, re-usable structures that showed evidence for repeated re-inhabitation. The strongest evidence for the importance of landscape anchors to the spatial organization of local pastoral landscapes comes from the clustering of campsites and cisterns. Clusters of campsites with different morphologies and taphonomic characteristics (and therefore likely of different dates) occurred around clusters of cisterns, suggesting that cisterns acted to encourage the seasonal re-inhabitation of certain areas. The modest size of the cisterns, the proximity of the river to all of the surveyed campsites, and the fact that cistern density does not increase with distance from the river all suggest that cisterns primarily fulfilled household water needs rather than animal water needs.

These observations about campsites and landscape features represent a first step towards an empirical understanding of pastoral land-use, daily activities, and conceptions of space in the past. Archaeological investigation of local pastoral landscapes provides an opportunity to examine the cumulative impacts that small groups of households had on the environment.

The dominant narrative in historical documents and most twentieth century ethnographies revolves around the physical and political pressures that the Ottoman and Turkish states brought to bear on pastoral nomadic territoriality and mobility in local and regional space in southeastern Turkey. However, this archaeological study of camping patterns demonstrates that at the local scale, pastoral land-use patterns were still also shaped by the landscape knowledge and decisions of herders. This knowledge and agency are evidenced through the permanent features they constructed in the landscape for the purposes of improving pasture and water resources. Although forced to use marginal spaces, regional transhumance, investment in the local landscape and management of seasonal resources allowed pastoral nomadic groups to survive.

Survey Methodology and Pastoral Nomadic Landscapes

The recovery of pastoral landscape features and their analysis was made possible by the specific methodologies adopted by this study, ones that have been employed infrequently in traditional Near Eastern archaeology. Chapter 5 demonstrates that most Near Eastern surveys are not intensive enough to capture the ephemeral traces of short-term seasonal inhabitation or have investigated areas (river valleys, plains) where modern-day intensive agriculture virtually eliminates the possibility that such evidence will survive. Archaeologists interested in pastoral nomadic groups should target upland and steppe areas for survey and excavation. Pedestrian transect survey methodologies developed in Mediterranean countries, also described in Chapter 5, are useful models for new surveys aimed at documenting sites that are frequently topographically indistinct in these steppe and upland areas of the Near East.

The “invisibility” of mobile groups has been the result of decisions about archaeological survey area and methodology. Most basically, studies aimed at pastoral nomadic landscapes must incorporate intensive survey methods, expand coverage beyond alluvial environments, focus attention on post-Classical settlement patterns, and incorporate spatial data from a variety of sources.

There are substantial challenges to an archaeology of pastoral nomadic landscapes. Researchers attempting to reconstruct them will invariably encounter certain issues related to the scale and location of their datasets. Transhumant pastoralism involved interregional movement, but documentation of ephemeral campsite features requires intensive coverage of small areas. Surveyors studying mobile groups face the challenge of examining local patterns while maintaining a regional outlook. Vertically transhumant pastoralists ranged over alluvial plains, steppes, and highland areas during the course of their transhumance cycles, but only campsites located outside of the alluvial plains are likely to survive in the archaeological record. Archaeologists thus also face the problem that part of seasonal pastoral cycles will in most cases be archaeologically inaccessible. These challenges may be partially overcome in several ways. Ethnography, historical documents, and satellite imagery can be effectively mined for spatial data that complement and extend the results of archaeological survey. Seasonality data on the pastoral landscapes that are archaeologically visible as well as isotopic analyses of human and animal teeth can provide clues to regional movement patterns.

A further challenge relates to chronology. Mobile pastoral groups did not use and discard large numbers of chronologically sensitive artifacts during their seasonal inhabitation of different areas, and thus campsites never have substantial datable surface assemblages. Where present, sherds may not come from diagnostic forms, as mobile pastoral groups did not necessarily use the same vessel forms and decoration styles as their sedentary neighbors, and ceramic chronologies are typically developed on the basis of excavations at sedentary settlements with stratified habitation levels. Researchers must adopt various radiometric methods suitable for dating both

campsites and surrounding landscape features. To reconstruct the use-history of landscape anchors, surveyors must excavate these features and obtain multiple radiometric dates.

Satellite photographs, multispectral satellite imagery, and digital terrain models have much to contribute to studies of pastoral nomadic landscapes in the Middle East. High-resolution satellite imagery can resolve the most visible pastoral campsites as well as check dams, cairns, and other landscape features. In areas where soils, vegetation cover, and hydrology have not been substantially transformed by modern agriculture, vegetation indices calculated from multispectral satellite imagery can be used to identify areas with the highest quality natural vegetation for pasturing animals. Digital terrain models can be used at a regional scale to model migration routes between seasonal pasture areas and at a local scale to assess proximity between campsites and the landscape features surrounding them. As the survey area is topographically uneven, spatial analysis of the Hirbemerdon Tepe data employed cost surfaces that took into account both distance and slope.

Satellite imagery analyses were limited, however, in that they were only useful for identifying particular types of pastoral campsites. Campsites with severely collapsed architecture and campsites consisting only of earthen tent platforms or stone bedding platforms were not visible in any satellite images because the component features of these campsites did not cast shadows and could be easily obscured by vegetation. Campsites with standing stone or brush architecture were only visible in the highest resolution images with a resolution of one meter or greater (IKONOS and Digital Globe). Elsewhere in the Middle East, historical CORONA spy satellite imagery has been extensively used to map landscape features, but it was of limited use for the Hirbemerdon area. CORONA imagery (maximum 2 meter resolution following georectification) was too coarse to resolve the distinguishing features of even well-preserved pastoral campsites. Anomalies in the multispectral satellite imagery that indicated anthropogenic soils in the plains of northern Syria instead marked geological features in the Upper Tigris area.

Broader Applicability of the Conclusions

The methodological discussion above highlights the need for intensive survey methodology in windows of high landscape visibility, a point that is broadly valid in most world regions. The ephemeral remains of any type of seasonal occupation by mobile societies will only be visible under specific surface conditions in places removed from modern development. The conclusions drawn from intensive surveys can provide testable models for more fragmentary remains recovered under less ideal conditions. For example, the campsites mapped in the upland edges of the Upper Tigris River Plain provide a model for interpreting small, sparse artifact scatters within the plain itself. The constellation of campsites, corrals, pasture improvement features, and water capture features documented around Hirbemerdon Tepe suggest what types of features Near Eastern archaeologists interested in pastoral land-use might look for in the mountains, hills, and plains surrounding the Fertile Crescent.

The conclusions of this study also have several substantial ramifications for the way we understand past mobile societies. The investigation of landscape anchors counters previous models of pastoral nomadic land-use by demonstrating that pastoral nomadic groups impacted their local landscapes in enduring ways and that landscape features oriented camping and herding patterns over long periods of time. Even when enclosed by territorial nation states, pastoral nomadic groups retained control over the organization of their landscapes and invested in permanent improvements that enhanced or increased the availability of natural resources. In terms of their interaction with the environment, mobile pastoral societies were fundamentally similar to agricultural societies in that they made cumulative capital investments in their local landscapes, investments that were undertaken as a means of subsisting, marking territory, and expressing senses of place.

Future Directions for this Study of Pastoral Nomadic Landscapes

The study raises a number of questions that will require further research. Pastoral nomadism has been a long-lived lifestyle in the Middle East and an adaptation to arid and semi-arid environments. From the Middle East as a whole, historical records indicate that pastoral nomadic tribes have existed for approximately 5000 years. The textual sources for the Hirbemerdon study area are limited, but indicate at least a 3000-year history for pastoral nomadism in general and a 1000-year history for long-distance mountain-plain pastoral nomadism in particular. The persistence of pastoral nomadism suggests that this was an important and sustainable land-use strategy. What about the particular landscape that has been documented by the Hirbemerdon Tepe Survey? Was this landscape sustainable and the land-use strategies viable for an extended period of time? The data from the survey begin to address these issues by examining quotidian pastoral activities in the landscape, how pastoralists invested in the landscape, the scale of these investments, and the potential impacts of these investments on the landscape. More fully assessing the long-term viability of this pastoral landscape requires a number of datasets that were not available to the survey team.

The main focus of future research should be to determine the chronology of the campsites and surrounding landscape features. As surface collections cannot resolve this chronology, radiometric methods must be applied. Carbon-14 would be suitable for dating campsites. Charcoal samples could be collected via shallow, targeted excavation in areas likely to contain hearths and middens. Middens have already been identified at a number of campsites on the basis of sediment discoloration and mounding. Ethnoarchaeological studies of modern pastoral nomadic tent surfaces in Turkey indicate that hearths are usually located in a restricted area at the far end of a tent platform and sometimes also immediately outside the tent. Probable hearth-spots are locatable at many of the surveyed campsites due to preservation of tent foundations and/or tent platforms.

A study of campsite chronology should also investigate whether surface indications of campsites represent re-inhabitations of earlier campsites. Ethnographic and ethnoarchaeological studies have shown that many groups use the same seasonal campsites for long periods of time, particularly when they have invested effort in building fixed structures such as the tent foundations and stone corrals mapped in the surveyed campsites. The cultural stratigraphy of the campsite locations could be investigated via sediment coring. Data on the frequency and timing of campsite inhabitation could confirm or complicate the argument that certain features served as landscape anchors for multiple generations of pastoral nomads.

Landscape features could be investigated via a variety of other radiometric dating methods. Cisterns and caves are two of the most important factors determining the location of campsites, and the chronology of these lithic structures can be investigated with a geological surface exposure method called terrestrial cosmogenic nuclide dating. This method would estimate their construction dates by comparing the concentration of cosmogenic chlorine-36 in interior carved and exterior uncarved limestone surfaces (for a recent archaeological application of similar methods in Turkey, see Akçar, et al. 2009). The use histories of cisterns and caves could be further investigated via excavation of the spoil heaps and talus slopes outside of their entrances. Cairns and check dams are more difficult to date, but possible methods include geomorphological studies such as those used to date dam and terrace systems in the Israeli Negev (Bruins 2007) and dating on the basis of lichen growth on rock surfaces (Benedict 2009). The gravestones in the cemetery on the Hasankeyf citadel could be used to develop local lichen growth curves for the last several hundred years.

Another significant avenue for future research is investigation of potential microscopic transformations of soils through grazing and animal dung deposition. Archaeological and ethnoarchaeological work in east Africa has developed a suit of methodologies for extracting data out of livestock dung (Shahack-Gross 2011), and these methodologies would also be applicable to the campsites within the Hirbemerdon area. Most basically, chemical evidence for the presence

of dung could aid in determining which stone structures were used as corrals and tent foundations in older, degraded campsites where the function of the collapsed structures is unclear.

Distinguishing corrals from tent foundations would assist in estimating past human and animal demography. The physical and chemical properties of dung may also in certain circumstances reveal the seasonality of campsite inhabitation, past environmental characteristics, animal diet/health, and herding/foddering strategies—all data that would provide empirical verification of many of the conclusions drawn for the Hirbemerdon area on the basis of spatial, ethnographic, and historical data.

From the Arameans, to the Mongols, to Arab tribes, pastoral nomadic groups have been a powerful force in Asian history. Their unstable relationships with sedentary polities such as the Assyrian, Roman, and Ottoman Empires often resulted in violence, and the waxing and waning of urban civilization has often been inversely tied to the strength of mobile tribal confederacies. Even during periods when tribes were politically weak, pastoral nomads remained important in subsistence and trade economies. Despite their clear societal role, we know relatively little about these groups.

Our historical models are not just missing a significant segment of the ancient and pre-modern Near Eastern population; they also lack data on a significant portion of the food and textile production systems. Historical texts and excavation have demonstrated that sheep and goat pastoralism were crucial to the resilience of the ancient Mesopotamian economy, but archaeologists know very little about the long-term management of the pastoral landscapes beyond core agricultural areas.

Although limited in time and space, this study presents grounds for optimism for a robust landscape archaeology of pastoral nomadic groups at all spatial scales. These groups were

important not only in the sociopolitical and economic development of Near Eastern societies, but also in the productive transformation of Near Eastern landscapes. Intensive surveys, targeted excavations, and radiometric dating programs have enormous potential to provide more complex diachronic reconstructions of pastoral nomadic land-use, sustainability, everyday movement, and senses of place. These four archaeologically accessible questions—of land-use, sustainability, everyday movement, and senses of place—are all intertwined and collectively provide an entry point by which to reconstruct pastoral nomadic history and change from the perspective of the mobile people themselves.

APPENDIX A: SITES IDENTIFIED BY THE HIRBEMERDON TEPE SURVEY

All coordinates are in Universal Transverse Mercator projection, WGS 1984 datum, Zone 37 north.

2007 Season

- 1) Hirbemerdon Tepe. Ca. 8 hectares including lower town. 677352 E, 4183083 N.
- 2) Artifact scatter in field to west of Hirbemerdon Tepe. Handmade sherds of probable Neolithic date. Ca. 2 hectares. 676784 E, 4183038 N.
- 3) Late Chalcolithic pottery, mudbrick structures, ovens, and living surfaces visible in and eroding out of the steep sides of gullies along the Tigris, approximately 1.5 meters below the current field surfaces. Extent difficult to determine, at least 0.25 hectares. 677675 E, 4183402 N.
- 4) Kavuşak Tepe. Area 1, Kavuşak Tepe, a 8-10 meter high mound with stone circles marking Islamic graves on the surface, ca. 1.3 hectares. Area 2, small area on the mound where illicit excavations have occurred and a stone wall is exposed. Area 3, low mounded area to the northwest of the mound with more Islamic grave circles, ca. 0.7 hectare. Area 4, site of another illicit excavation along the Tigris where a one-meter high wall made of unfinished white stones has been exposed. Area 5, area to the north of the main mound, adjacent to the Tigris, near Area 4, ca. 1 hectare. Area 6, unmounded area to the west of the main mound that was under a cotton crop and yielded substantial amounts of pottery, ca. 0.5 hectare. Area 7, low mounded area to the northeast of the main mound that is now used as a garden, ca. 0.4 hectare. Area 8, Kavuşak village, ca. 1 hectare. Tepe itself is at 674609 E, 4184134 N.
- 5) Lithic scatter atop a conical hill, approximately 375 meters northwest of Kınık village. Flint debitage; flakes and some cores but no tools. Disturbed by a modern tower and well. Ca. 0.3 hectares. 673049 E, 4183855 N.
- 6) Very light sherd scatter atop a high east-west peak on Tigris, approximately 850 north-northeast of Kınık village. Ca. 0.2 hectares. 673521 E, 4184326 N.
- 7) Cemetery east of Tepekonak covering two peaks of a ridgetop. Consists of looted burial pits, occasionally lined with stone slabs, between 0.25 m X 0.5 m and 1 X 2 m in size. Edges of the area with burials have 6 cairns, some of which are heavily covered with lichen and others of which are jumbled/of recent construction. Total area ca. 0.8 hectare. 675984 E, 4180698 N.
- 8) Eski Tepekonak. Area 1, collapsed stone foundations of a former village. Area 2. Area 3, substantial Hellenistic field scatter to the west of the former village. Former village ca. 0.7 hectare; Hellenistic field scatter not fully defined during fieldwalking, but extent is at least 7.8 hectares. Village is at 675676 E, 4180814 N and field scatter is at 675115 E, 4180866 N.
- 9) Cemeteries on three peaks of a ridge north of Tepekonak. Looted burial pits that are frequently lined with stone slabs, identical to those at site 7. Total area ca. 1.3 hectares. 675938 E, 4181111 N.
- 10) Light scatter of handmade sherds on spur over wadi, ca. 1200 meters north of Tepekonak. Ca. 1.4 hectares. 675886 E, 4181432 N.
- 11) Cemetery on top of ridge overlooking wadi on east side. About 12 looted burials, stone lined. About 0.01 hectare. 675849 E, 4181594 N.

- 12) Single large burial on a promontory on east side of wadi. Looted pit ca. 7 meters north to south with ring of large stones about 1.5 meters distant around it. No artifact scatter. Ca. 0.03 hectare. 675843 E, 4181701 N.
- 13) Cemetery, few pit burials. Ca. 0.06 hectare. 675742 E, 4181771 N.
- 14) Lithic scatter at top and down sides of a local high spot. Lithics mostly on south slope. Ca. 0.3 hectare. 675291 E, 4181537 N.
- 15) Corral and series of rock piles on east-facing slope of local high spot. No pottery. Ca. 0.1 hectare. 675353 E, 4181601 N.
- 16) Area 1, cairns covering ca. 0.3 hectare. Area 2, lithics and pottery scatter at summit of natural ridge, covering ca. 0.4 hectare. Area 3, cairns and recently constructed perpendicular walls covering ca. 0.5 hectare. Area 4, large cairn field with flattened linear stone alignments, covering ca. 5.3 hectares. Area 5, fields west of Area 4 that contain abundant lithic material. 676895 E, 4180803 N.
- 17) Campsite marked by a flat stone circle. Ca. 0.0067 hectare. 677904 E, 4180817 N.
- 18) Twentieth century campsite with stone tent foundations and cave pens in adjacent limestone slopes. Ca. 1.7 hectares. 678615 E, 4180572 N.
- 19) Field scatter to the southeast of Hirbemerdon Tepe, west of Merdani village. Ca. 1.6 hectares. 677542 E, 4182616 N.
- 20) Cemetery with looted pit burials. Ca. 0.43 hectares. 675669 E, 4182452 N.
- 21) Lithic scatter. Ca. 1.1 hectares. 675456 E, 4182027 N.
- 22) Field scatter to the west of Hirbemerdon Tepe. Ca. 1 hectare. 677111 E, 4183371 N.
- 23) Şahinli village. The non-packed earthen surfaces of the village include pottery of earlier periods, including glazed Medieval Islamic period sherds. Ca. 1 hectare. 677445 E, 4184048 N.
- 24) Cistern. Opening faces east-north-east. Three steps lead down into a tank chiseled out of the limestone bedrock. Water channels on the bedrock surface surrounding the cistern direct water into the tank. 679354 E, 4179613 N.
- 25) Very light lithic scatter. Ca. 0.46 hectares. 674115 E, 4183185 N.
- 26) Campsite with collapsed stone walls likely from rectangular tent foundations, now flattened. Ca. 0.3 hectare. 678439 E, 4180986 N.
- 27) Scatter of Paleolithic lithics. Ca. 0.9 hectares. 673405 E, 4184486 N.
- 28) Formerly domed (?) stone structure in a gully flowing into the site 18 wadi. Stacked stones, some mortar. Thick (ca. 1 meter) incurving walls. Possibly a water catchment feature. 0.003 hectare. 679286 E, 4179798 N.
- 29) Stone footings to a bridge on the right bank of the Tigris, approximated 800 meters north of Hirbemerdon Tepe. Possibly equivalent to the site 84 (Şahinli Düzü Köprü) identified by Algaze et al. (1991). 0.08 hectare. 677947 E, 4183517 N.

2008 Season

- 30) Ceramic and lithic scatter on high ridge east of Mesüdiler Köy/Merdani. Several cairns at the south and west edges, and possible terracing along the slopes to the east. Ca. 5.5 hectares. 678335 E, 4182335 N.
- 31) Abandoned pastoral nomadic campsite north-north-west of field 898 on east slopes of north-south ridge. Several stone alignments (bedding platforms?) visible and a very light sherd scatter. Ca. 0.17 hectares. 678747 E, 4182130 N.
- 32) Ceramic and lithic scatter 70 meters east of main north-south wadi near its mouth at Tigris floodplain. Ca. 0.002 hectares. 678640 E, 4182393 N.

- 33) Lithic and ceramic scatter on a low hill on left side of major north-south wadi. Finds include an iron arrowhead of probable Medieval Islamic date. Ca. 1.13 hectares. 678414 E, 4181657 N.
- 34) Güzel Köy settlement complex. Area 1 is a tepe at the N end of the modern village of Güzel Köy covered by an extensive recent cemetery (although predating the present village, according to the mukhtar). Sherds include later 3rd millennium (metallic ware and dark rimmed orange bowls), early 2nd millennium (red-brown washed ware and Khabur ware), Iron Age, and Islamic. Area ca. 0.73 hectares. 676194 E, 4178125 N. Area 2 is a 2.1 hectare complex of two earthen check dams, two substantial cisterns, and a former mill stone facility 350 meters east of the tepe at Güzel Köy (Area 1). None of these features can be dated directly but the village mukhtar claims that they have not been used in his lifetime. 675828 E, 4178165 N.
- 35) Small village site of collapsed stone architecture, probably late Ottoman in date. The site sits on a high terrace overlooking the Tigris floodplain. Area 1 is 0.16 hectare of collapsed square room blocks (approximately 3 households with several courtyard areas) and light sherd scatter. Area 2 is a sloping area below it to the north consisting of midden deposits from the structures in Area 1. Area 3 is the settlement's cemetery, consisting of approximately 15 stone ovals with earthen mounds in the center; two of these burials have been looted within the last two years. Area 4 is a gentle slope to the NE between the village in Area 1 and the cemetery Area 3. Total area of the complex 0.76 hectares. Center of Area 1 679200 E, 4182998 N.
- 36) Large complex of recently occupied (but presently abandoned) campsites of pastoral nomads. At least six separate households occupied the gentle slopes on either side of a minor north-south wadi near the Tigris River. Each household consisted of a cleared tent area, an associated kitchen area with reed or stick walls, and up to 10 additional animal enclosures variously constructed of reeds, bundled sticks, or dry-laid stones. Animal structures were clearly identifiable by the thick deposits of dung. Also present were linear wicker structures used as animal feeding troughs, which could be up to 20 meters long. Informants at Mesüdiler Köy claim that the camp was inhabited as recently as April 2008. In June 2008 two adjacent camp groups were mapped on the west side of the wadi (structures 1-19), and another small campsite was sketched on the right bank. At least three other camp groups exist above and below this area in the wadi. Ca. 3.7 hectares. Center of western mapped group 680835 E, 4181495 N.
- 37) Complex of rock shelters, carved caves, and a large cistern on opposite sides of a north-south wadi at a deep and narrow point. Two rock shelters have front walls of dry stones on west side of the wadi, with a single-roomed cave between them; in front and sloping down to the wadi is a talus slope full of cultural material. In recent years all three features have been used as animal shelters. On the east side is a large cistern. Ca. 0.1 hectare. Center of complex 680922 E, 4180112 N.
- 38) Extensive complex of carved caves, cisterns, tent sites, and animal enclosures in two adjacent valleys. Within the wadis are 19 structures, variously stone-built animal enclosures, areas of former wooden enclosures (now completely decayed), and cleared spaces for tent sites. On the wadi edges and cut into the bedrock valley walls are approximately 30 elaborately carved cave structures, many with multiple rooms and internal features such as benches, basins, skylights, windows, doorframes, etc. Most show signs of having been used to house animals in recent years, but almost all were originally intended for human habitation, in the same manner as the cave houses of Hasankeyf, which they resemble very closely. The slopes in front of the caves down into the wadi are rich with cultural material from both the caves (in the distant past) and from the tent sites (in the more recent past). The artifact scatter consists of Middle Islamic to Ottoman pottery but also plastic, glass, metal, and fabrics. The entire complex covers approximately 3.2 hectares. Center of complex 681013 E, 4180350 N.

- 39) Complex of collapsed and eroded circular structures on terrace above north-south wadi along its left bank. Surrounded by a light scatter of sherds and lithics. Total area 0.23 hectares. Center of complex 678222 E, 4181445 N.
- 40) Pair of recent campsites on gentle slopes down to west on right side of main north-south wadi. A light ceramic scatter in the middle of a dense scatter of glass, metal, plastic, and fabric, especially at the eastern and western ends. Immediately north of dirt track to east. Ca. 1 hectare. Center of complex 678638 E, 4181496 N.
- 41) Small complex of dry stone structures with almost no cultural material scatter on north-south ridge between two wadis. Several stone cairns may be older. Center of complex 678739 E, 4182015 N.
- 42) Long abandoned pastoral nomadic campsite on low flat terrace above a small wadi, on its left side. Approximately 12 stone bedding platforms indicate a camp of as many as one dozen tents. No obvious animal enclosures. 0.08 hectare total area. 680853 E, 4181211 N.
- 43) Large cemetery along a long north-north-west to south-south-east ridge on east side of wadi. Approximately 1130 square meters. Well preserved burials at southeast end consist of stone circles with low mounds of earth; older burials at northwest end are far more disturbed. At least 110 burials and probably many more. Possibly the cemetery for pastoral nomadic communities at Sites 36, 38, and 42. Ca. 0.1 hectare. Center of cemetery at 680945 E, 4181147 N.
- 44) Large cave on right bank tributary drainage valley into main north-south wadi, south facing with large talus slope below it. A dry stone wall of recent origin 1 meter high at entrance, and recent use as an animal shelter. 678660 E, 4181330 N.
- 45) Cistern. 678683 E, 4181256 N.
- 46) Pair of corrals, stone-walled. Each ca. 0.004 hectare. 678609 E, 4181303 N and 678622 E, 4181297 N.
- 47) Cistern, 200 meters north of site 39. 678319 E, 4181652 N.
- 48) Cave on the east side of a wadi 110 meters east of site 18. 678766 E, 4180453 N.
- 49) Collapsed stone structure below the southeast edge of a large plateau. Ca. 0.13 hectare. 678784 E, 4179962 N.
- 50) Double stone corrals. Ca. 0.028 and 0.011 hectares. 678914 E, 4180113 N and 678904 E, 4180113 N.
- 51) Stone corral, 20 meters in diameter. 679053 E, 4180136 N.
- 52) Double stone enclosures. Each ca. 0.015 hectare. 678319 E, 4179953 N and 678306 E, 4179950 N.
- 53) Circular stone structure ca. 0.009 hectares on top of a large plateau, 678157 E, 4179878 N. Plateau is has hundreds of cairns covering almost 11 hectares, 678028 E, 4180034 N.
- 54) Large stone enclosure on the southwest side of a large plateau. Ca. 0.29 hectare. 677949 E, 4179635 N.
- 55) Extensive lithic scatter along west and east sides of a wadi, 700 meters west-northwest of Güzel Köy. Extent more than 2.1 hectares. 675585 E, 4178385 N.
- 56) Cistern, dimensions ca. 10 X 5 X 3 meters, within the area of site 55. 675579 E. 4178449 N.
- 57) Cairn field covering ca. 0.6 hectare. 675497 E, 4178810 N.
- 58) Lithic scatter, collection point for extensive scatter along both sides of wadi. 600 meters west of Güzel Köy. Collection area ca. 0.28 hectares. 675797 E, 4178619 N.
- 59) Cut tomb on hilltop. Looted. 676051 E, 4178984 N.
- 60) Rock shelter across the wadi from site 59. 676167 E, 4179082 N.
- 61) Lithic scatter on field edge directly above site 60. Collection point for extensive lithic scatter also documented through sites 55 and 58. Collection area ca. 0.07 hectares. 676175 E, 4179116 N.
- 62) Area of flakes and tested cobbles. Several tent bedding platforms just above the wadi on the left side. Ca. 150 meters west of site 59. Ca. 0.5 hectare. 675908 E, 4178956 N.

- 63) Complex of Paleolithic scatters, campsite bedding platforms, cairns, stone alignments, and earthen runoff catch dams on either side of a small wadi. Total area ca. 1 hectare. Approximate center is at 680611 E, 4180117 N.
- 64) Rockshelter, 20 meters long and 5 meter deep at deepest point. Interior stone alignments. Talus slope and terrace wall below to the southeast. 680680 E, 4180433 N.
- 65) Collapsed stone structures and enclosures in natural basin on right side of wadi. Ca. 0.1 hectare. 676066 E, 4179450 N.
- 66) Group of collapsed linear structures, possibly former corrals. Ca. 0.04 hectare. 680789 E, 4180581 N.
- 67) Rock-cut cistern in the middle of west-facing drainage into wadi. 678882 E, 4181311 N.
- 68) Cairn field and light artifact scatter near large north-south wadi. Ca. 80 meters in length north-south.
- 69) Rock-cut caves in Tigris cliffs north of site 30, with access from the top of the cliffs. 678355 E, 4182448 N.
- 70) Rock-cut cave on the right bank of the Tigris. 678794 E, 4182806 N.
- 71) Area of rockshelter, two stone enclosures at head of north-south wadi near the Tigris. Ca. 0.088 hectare. 679396 E, 4182837 N; 679375 E, 4182823 N; 679372 E, 4182799 N.
- 72) Square enclosure and associated collapsed structure, too collapsed to hypothesize about the structures' functions. Dimensions ca. 11 X 8 meters. Ca. 100 meters west of rockshelter at site 71. 679490 E, 4182821 N.
- 73) Small stone circular enclosure with associated check dam. Ca. 0.006 hectare. 679466 E, 4182946 N.
- 74) Lithic scatter on slope west of cemetery at site 43 and southeast of site 42. Ca. 0.4 hectare. 680927 E, 4181097 N.
- 75) Cairns on left side of wadi, covering 0.65 hectares, same site as 68. 678527 E, 4182119 N.
- 76) Cave with large talus slope on slopes east of site 18. 678754 E, 4180577 N.
- 77) Stone water collection feature of wadi east of cave 48. 679103 E, 4180355 N.
- 78) Very small water catchment feature (check dam) south of site 63. 680546 E, 4179992 N.
- 79) Stone built water catchment feature in wadi. Four meters in diameter, with faced and angled stones on edge of access at west side. Some sides preserved over 2 meters high. Possibly domed. 679797 E, 4108382 N.
- 80) Cairn field covering ca. 0.27 hectare at mouth of small drainage onto Tigris floodplain. 679540 E, 4183065 N.
- 81) Large circular stone walled enclosure. Ca. 0.03 hectare. 679660 E, 4180755 N.
- 82) Concentration of 18 small check dams and terraces in a small drainage. Ca. 0.59 hectare. 679410 E, 4182355 N.
- 83) Small cave along left bank of wadi, near Tigris floodplain. 680825 E, 4182200 N.
- 84) Small cave along right bank of wadi, near Tigris floodplain. 681140 E, 4182100 N.
- 85) Series of three caves along right bank of wadi, near Tigris floodplain. 681145 E, 4182000 N.
- 86) Check dam on left side of north-south wadi, 225 meters north of Site 36. 680925 E, 4181770 N.
- 87) Cairn field and artifact scatter on east slope of high hill. Ca. 0.18 hectare. 681137 E, 4181715 N.
- 88) Dispersed area of disturbed bedding platforms/tent bases over 0.36 hectares. 680390 E, 4181370 N.
- 89) Stone dam 1 meter thick, 6 meters long, 5 courses high, washed out in wadi of Site 58. 675838 E, 4178800 N.
- 90) Circular stone structure on west side of the track from Site 38 to Site 36, 3 meters in diameter, 1.5 meter deep. Possibly a disturbed tomb, possibly a water catchment feature like Sites 28 and 77. 680887 E, 4181030 N.
- 91) Pair of earthen check dams. Ca. 0.015 hectare. 680910 E, 4180017 N.

- 92) Collapsed circular stone structure near wadi, possibly for water retention like Site 90. Ca. 0.009 hectare. 680110 E, 4181845 N.

2009 Season

- 93) Artifact scatter (sherds and lithics) over 0.75 hectares on low Tigris terrace, north edge of survey region. Under fallow field at time of collection. 676545 E, 4183440 N.
- 94) Merdani cave tomb. Single square chamber with three side alcoves. Visited by the previous survey of Classical period sites (Barin, et al. 2003). 677410 E, 4182900 N.
- 95) Rock shelter on high right bank of Tigris, 350 meters southeast of Hirbemerdon. 677560 E, 4182750 N.
- 96) Cave dwellings and collapsed stone architecture in a small drainage near Merdani Köy. Complex covers roughly 6.7 hectares and includes at least 12 carved houses, several with external walled additions. Ceramics were Islamic (including Abbasid) but it is possible that the caves were carved earlier. Center of complex 678000 N, 4182375 E.
- 97) Small mounded tepe site, unnamed. Mounding covers 1.8 hectares, approximately 8 meters in height. Under harvested cereals at time of visit. Middle Bronze Age ceramics. 672780 E, 4180900 N.
- 98) Sherd scatter and possible tent footing. Loose scatter of stones on a flat area next to a wadi, 0.07 hectares. 677750 E, 4178035 N.
- 99) Ridge-top pair of cisterns and sherd scatter. Ca. 0.038 hectare. 678370 E, 4179160 N.
- 100) Sloped area of cairns on left bank of a deep wadi. Ca. 1.5 hectares. 678230 E, 4179250 N.
- 101) Cairn field. Ca. 0.28 hectares. 678525 E, 4178610 N.
- 102) Abandoned village of Otlü. Ca. 3 hectares, covering to diverging lobes of a small valley extending south from the Tigris. 681980 E, 4181220 N.
- 103) Circular stone feature in wadi bottom, probably for water retention. Five meters in diameter, walls about 1 meter thick. On west side, a paved surface in wadi bed. Immediately west of a modern dirt track. 679800 E, 4179860 N.
- 104) Campsite with 2 corrals and a rock shelter with a small enclosure for young animals. Ca. 0.32 hectare. 679462 E, 4178690 N.
- 105) Dry stone rectangular animal enclosure built into a natural crevasse in the upper part of a small but steep and deep side valley. In the valley are small rock shelters that appear to have been rubbed down by sheep (based on the presence of smoothed white rock). The rock shelters are also filled with dung. The valley was filled at the time of survey with the dried remains of lush grass. 679400 E, 4180270 N.
- 106) Ridge-top cisterns (3) and associated sherd scatter. Ca. 0.82 hectare. 681250 E, 4181960 N.
- 107) Early twentieth century village and associated cemetery on low Tigris terrace, covering 0.7 hectares. Ca. 0.72 hectare. 681350 E, 418220 N.
- 108) Double animal enclosure in figure-eight form. Ca. 0.05 hectare. 681150 E, 4181246 N.
- 109) Corral on terrace above wadi, north of Site 104. Ca. 0.015 hectare. 678945 E, 4179420 N.
- 110) Circular rock shelter with dry stone walled entrance. On right bank of wadi near Tepekonak. 676000 E, 4179630 N.
- 111) Pair of bell-shaped cisterns on west edge of wadi near Tepekonak. 675885 E, 4179935 N.
- 112) Small cemetery with pit graves near modern village of Tepekonak. Looted. Approximately 20 graves. Probably Hellenistic. Ca. 0.061 hectare. 675960 E, 4180100 N.
- 113) Dry stone animal enclosure, partly built against natural bedrock outcrop. Ca. 0.01 hectare. 678920 E, 4179070 N.

- 114) Circular animal enclosure on east-facing hill slope. Roughly square 15 x 10 meter dry stone, 30-75 centimeter high walls. Entrance at southeast corner, north wall is exposed bedrock outcrop. Little dung, small stones, heavily lichen covered. 679870 E, 4181260 N.
- 115) Cairn field on northeast facing slopes, on left side of small drainage. At least 12 undisturbed cairns. Ca. 0.33 hectare. 679730 E, 4179995 N.
- 116) Rockshelter, 6 meters high, enclosed by a dry stone wall, abundant sheep dung within; small rectangular enclosure outside of rockshelter. 679370 E, 4180115 N.
- 117) Three small stone and earth check dams across a small drainage on left bank of large north-south wadi. Ca. 0.031 hectare. 679190 E, 4179770 N.
- 118) Three isolated burials, circles of stones, 2 with standing headstones. Ca. 0.0031 hectare. 678370 N, 4178570 E.
- 119) Check dam across small east-flowing drainage. 681190 E, 4181480 N.
- 120) Cave tomb 1.75 meter deep, 3 meter wide with 1.7 meter high ceiling. Three chambers, with each end having a barrel arch. Above Site 107 on Tigris floodplain edge. 681340 E, 4181970 N.
- 121) Cairns and terraces in an upper side valley. Ca. 0.21 hectare. 680350 E, 4179110 N.
- 122) Terraces in a small upper side valley. Ca. 0.1 hectare. 680875 E, 4179560 N.
- 123) Small cave with terrace below and gray ashy talus slope, north of Site 101. 678550 E, 4178690 N.
- 124) Linear cave for animals, near Site 107. 681400 E, 4181910 N.
- 125) Sherd and lithic scatter over ca. 0.23 hectares. In the middle of a burned and plowed field at time of collection. 400 meters southeast of Şahinli village. 677640 E, 4183700 N.
- 126) Artifact scatter over 0.77 hectares on north edge of gravel terrace above Tigris river, under harvested cereal field. 900 meters northeast of Şahinli village. 678060 E, 4184800 N.
- 127) Lithic scatter over 0.41 hectares on a low gravel ridge between two north-flowing drainages. 970 m west-south-west of Hirbemerdon Tepe. Under a burned cereal field at time of collection. 676390 E, 4182850 N.
- 128) Artifact scatter over 1.0 hectare at the base of a gravel ridge, on the left side of the Hirbemerdon Tepe wadi. Under a burned cereal field at time of collection. 676960 E, 4181740 N.
- 129) Cave dwellings carved into the cliffs on the Tigris bank below the village of Merdani, approximately 15 meters above the level of the river. At least four room complexes, possibly interconnected. The facades are eroding and collapsing into the river, so they could not be accessed by the survey team. 677945 E, 4182584 N.
- 130) Cave dwellings carved into the cliffs on the Tigris bank 300 meters southeast of Hirbemerdon and 300 meters northwest of Merdani village. Two sets of room complexes, both approximately 10-15 meters above the Tigris river level. Facades of both have eroded into the river valley, neither was accessible to the survey team. 677580 E, 4182810 N.
- 131) Cave dwellings carved into the cliffs on the Tigris bank. Series of eroded openings up to 20 meters above the Tigris level, possibly multi-story. All facades eroded and collapsed into the Tigris, none accessible to the survey team. 425 meters southeast of Hirbemerdon Tepe, 200 meters northwest of Merdani village. 677690 E, 4182735 N.

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- 132) Hill with abundant lithic debitage, a premodern source for stone materials. Debitage covers at least 10.87 hectares. 677554 E, 4179334 N.
- 133) Stone and earth cross dam across wadi, 600 meters northeast of Tepekonak village. 676119 E, 4180716 N.

- 134) Cistern/tomb complex on east bank of wadi, 400 meters northeast of Tepekonak village. Very similar to the complex at site 65. Ca. 0.089 hectares. 675951 E, 4180594 N.
- 135) Lithic and ceramic scatter 450 meters northwest of Kınık. Ca. 0.74 hectare. 672873 E, 4183804 N.
- 136) Lithic scatter 700 meters northwest of Kınık. Ca. 0.58 hectare. 672676 E, 4183958 N.

APPENDIX B: SITES IDENTIFIED VIA DIGITAL GLOBE SATELLITE IMAGERY

All coordinates are in Universal Transverse Mercator projection, WGS 1984 datum, Zone 37 north.

- 200) Campsite consisting of two groups of rectangular structures 0.6 kilometer from Tigris. At least 18 stone enclosures of various sizes visible. 1 highly disturbed central area that could be a tent surface. Northern edge of the campsite seems to follow the edge of a former field boundary. 684449 E, 4180606 N.
- 201) Campsite consisting of at least 21 rectangular stone enclosures, 6 linear features (4 parallel to each other) that might represent the remains of wicker feeding troughs. The enclosures are arranged along the edges of an irregularly shaped plowed field positioned in the base of a drainage. Several of the enclosures are positioned in natural “alcoves” formed by the exposed limestone bedrock. The dark surfaces of the enclosure interiors and the preservation of wicker feeding troughs suggests recent use. 684312 E, 4179789 N.
- 202) Modern orchard/tree farm, surrounded by check dams of both recent and possibly earlier construction. 687854 E, 4179844 N.
- 203) Kantar Köy. Modern village with animal enclosures, surrounded by agricultural fields. 688282 E, 4179027 N.
- 204) Cellular stone foundations of a long-abandoned village immediately adjacent to the Tigris River. Fields adjacent to this village are filled with clearance cairns, site 205. 688489 E, 4181120 N.
- 205) Field clearance cairns in fields to the south of abandoned village 204. 688579 E, 4180829 N.
- 206) Set of at least 6 stone structures each ca. 2 X 2 meters on top of a hill. Probably the shooting blinds of an army camp; 14 of the structures are arranged in a circle around the top of the hill. 689008 E, 4179015 N.
- 207) Cellular stone foundations of what appears to be an abandoned farmstead on a wadi terrace. Immediately to the north are 6 rectangular stone enclosures which appear very much like those of a campsite, but which probably should be associated with the farmstead. To the east and southwest are field systems marked by terraces and check dams. 691996 E, 4177649 N.
- 208) Relict terraces and check dams. 690934 E, 4176005 N.
- 209) Cellular stone foundations of an abandoned village/farmsteads on a hilltop, overlooking a complex of relict terraces and check dams. 690061 E, 4175433 N.
- 210) Cellular stone foundations of an abandoned village/farmsteads on a hilltop, overlooking a complex of relict terraces and check dams, relict agricultural fields. 690056 E, 4173441 N.
- 211) Isolated pair of rectangular stone enclosures (2 enclosures sharing one wall) approximately 15 X 5 meters on a hillside. Animal corral or fieldhouse? Located on slope below site 212. 689974 E, 4171336 N.
- 212) Abandoned farmstead on hilltop. 689843 E, 4171425 N.
- 213) Campsite with two sets of rectangular stone enclosures; located only 225 meters west of site 212. The northern set is located on a slope and consists of 9 enclosures of various sizes clustered together with minimal space between them. The southern set consists of 12 enclosures of various sizes arranged linearly along the base of a small drainage. The

- lower part of this drainage has a series of at least 12 parallel check dams. 689619 E, 4171617 N.
- 214) Modern farmstead on a hilltop, surrounded by terraces and check dams. 689724 E, 4173684 N.
 - 215) Foundations of an abandoned structure that appears to be modern. 690537 E, 4175367 N.
 - 216) Modern village on a hilltop; 3 houses surrounded by irregularly shaped animal enclosures. Village overlooks agricultural fields with rock boundaries and terrace/check dam features. Immediately to the east is an area with earth and stone alignments that appears to be an abandoned garden. Corral 217 is 150 meters to the west. 696121 E, 4177458 N.
 - 217) Isolated corral on a wadi terrace below village 216. Irregularly shaped stone walls. Ca. 25 X 10 meters. 695952 E, 4177312 N.
 - 218) Kumluca Köy, modern village near Tigris with field systems incorporating clearance cairns on a terrace between the village and the river. 699554 E, 4178532 N.
 - 219) Clearance cairns in fields between Tigris River and Kumluca Köy. 699632 E, 4178704 N.
 - 220) More clearance cairns in a relatively flat, depressed area to the east and south of Kumluca Köy. Relict field systems possible foundations of fieldhouses. 700655 E, 4177657 N.
 - 221) Geçit Köy, modern village positioned north of its agricultural fields. 699069 E, 4167929 N.
 - 222) Campsite consisting of 8 rectangular stone enclosures. Positioned on a low wadi terrace next to a flowing stream. 701809 E, 4177047 N.
 - 223) Clearance cairns and many linear stone alignments marking an extensive relict field system covering the top of a broad plateau ca. 650 meters wide and 1400 meters long. 706494 E, 4176588 N.
 - 224) Campsite on a terrace immediately adjacent to the Tigris. Consists of 7 well-preserved stone enclosures and an additional 4 stone enclosures with a more faint signature on the satellite imagery. This is the campsite that is visible from the Batman-Hasankeyf road on the opposite side of the river. 706285 E, 4177580 N.
 - 225) Campsite or farmstead/village positioned on the low terrace of a verdant wadi near the Tigris. The stone foundations of the structures are partially collapsed and difficult to interpret, but the layout of the structures suggest it was more likely a village. The edges of the field to the north and east follow the edges of the area with the visible foundations. 706868 E, 4177610 N.
 - 226) Çardaklı Köy. Modern village at the base of a steep-sided gorge. Tree-lined field systems of this village follow the base of the verdant wadi at the bottom of the gorge. 705897 E, 4173257 N.
 - 227) Tepebaşı Köy. Modern village on top of the north ridge of the gorge in which site 226 is located. Fields of this village are in wadi below, but also extend north, in small depressions between limestone hilltops above the gorge. 706606 E, 4173075 N.
 - 228) Aksu Köy. Modern village beside tree-lined field systems in the base of the same wadi adjacent to sites 226 and 227. Field systems marked by terraces also extend up the slopes to the northeast and southeast of the village. 708252 E, 4171021 N.
 - 229) Kayalar Köy. Modern village in the same gorge with sites 226, 227, 228. Tree-lined field systems in base of wadi, more field systems marked by terraces on slopes to east of village. 705742 E, 4172091 N.
 - 230) Campsite consisting of 10 rectangular stone enclosures and the faint outline of two other possible enclosures. Structures are arranged on either side of a wadi on the left (north) bank of the Tigris. 694715 E, 4179884 N.
 - 231) Foundations of several abandoned structures on a ridge above the Batman-Hasankeyf road. 702498 E, 4179166 N.

- 232) Large area of relict field systems following the left (north) bank of the Tigris for ca. 11.5 kilometers, extending up to 2.8 kilometers from the river. Marked by terraces, cairns, and check dams. 706143 E, 4178691 N.
- 233) Relict fields surrounding the structures of site 285, filled with stone clearance cairns and linear stone alignments. Fields cover a broad terrace ca. 750 X 400 meters. 702487 E, 4178639 N.
- 234) Large area of relict field systems covering ca. 1750 X 950 meters on a terrace adjacent to the Tigris, north of abandoned village 216. The fields are marked by stone clearance cairns and linear alignments. Some of the fields nearest to site 216 have been recently farmed. 696504 E, 4178698 N.
- 235) Cellular stone foundations of a long-abandoned village on the left bank of the Tigris, directly across the river from the relict field systems 234. An old track on both sides of the river (which is narrow in this location) as well as a lack of indications of fields in the vicinity of this village suggests that the inhabitants of this abandoned village may have farmed the fields on the opposite river bank at sites 234 and 236. 695246 E, 4178645 N.
- 236) Relict field systems along the right (south) bank of the Tigris. Marked by linear earthen alignments, few stone clearance cairns. Covers ca. 600 X 200 meters. 694579 E, 4178431 N.
- 237) Modern field system with terraces and check dams, covering ca. 300 X 200 meters. 691990 E, 4178508 N.
- 238) Uncultivated field system with terraces and check dams, south of Kantar Köy 203. Fields dispersed along the bases of small drainages. 687727 E, 4177853 N.
- 239) Uncultivated field system with terraces/check dams. Fields dispersed along the bases of small drainages. Some fields on wadi terraces recently farmed. 691052 E, 4178157 N.
- 240) Campsite immediately adjacent to the Tigris, on the right bank. Campsite consists of four distinct clusters of stone structures spread over 250 meters of the river bank at the south end of the field system associated with abandoned settlement 233. At the north end are 2 clusters, each with 9 rectangular stone enclosures of various sizes. One cluster is more dispersed and the other is more compact. In the middle is a disperse cluster of at least 6 but possible as many as 10 stone rectangular enclosures of various sizes. Three of these enclosures are constructed against a limestone outcrop such that the rock forms one of their walls. At the south end is a cluster of 6 rectangular stone enclosures. Four of these are double enclosures, with two structures sharing one of their walls. 702443 E, 4178294 N.
- 241) Campsite on the terraces of a wadi. 18 stone enclosures of various sizes, some small enough to be tent footings. On the north side of the site are two sets of cellular foundations that are difficult to interpret. At the northeast corner of the site is a cluster of small circular features less than four meters in diameter; these are also difficult to interpret. Check dams surround the campsite. 686295 E, 4176982 N.
- 242) Modern farmstead surrounded by fields. 690862 E, 4176827 N.
- 243) Series of 8 rectangular stone enclosures arranged linearly along the edge of an irregularly shaped field. Enclosures are quite spaced out and the furthest two are ca. 300 meters from each other. 719375 E, 4176585 N.
- 244) Campsite located on the terraces of a wadi. 16 rectangular stone enclosures of various sizes, some small enough to be tent foundations. 2 faint rectangular outlines that could be the remains of partially collapsed corrals or corrals primarily constructed of perishable materials. 692174 E, 4176408 N.
- 245) Modern village on a limestone ridge overlooking slopes with terraces and check dams (site 246). To the north are more field systems marked by check dams. 689261 E, 4175744 N.

- 246) Uncultivated terraces and check dams on the hillside across the wadi from village 245. 689716 E, 4175244 N.
- 247) Uncultivated field system outlined by trees and marked by terraces and check dams. North of village 245. Most of the fields are long and sinuous, following the bases of drainages; some on the east side are a bit broader. 689693 E, 4176431 N.
- 248) Topraklı Köy. Modern village south of Ahmetli and Güzelköy, at the interface between the Upper Tigris River Plain and the uplands. 672846 E, 4175927 N.
- 249) Eymir Köy. Modern village east of Topraklı, surrounded by agricultural fields. 681982 E, 4175434 N.
- 250) Eski Eymir Köy. Abandoned foundations immediately north of Eymir Köy (site 249). 682045 E, 4175600 N.
- 251) Modern village on top of a ridge. Linear layout along a track. Surrounded by agricultural fields. 683967 E, 4175787 N.
- 252) Foundations of an abandoned village, presumably the older version of 251, especially as it follows the same type of linear layout along a track. 683893 E, 4175592 N.
- 253) 650 X 715 meter area of abandoned buildings and relict field systems immediately east of the modern village of Hasankeyf, to the south of the Batman-Mardin road. 713861 E, 4176319 N.
- 254) Campsite located on a broad plateau beside some isolated recently farmed agricultural fields. Consists of 8 large rectangular stone enclosures and at least 7 smaller more faint rectangular stone structures. An additional area is blackened, presumably with dung, and may represent the remains of a corral constructed out of ephemeral materials. Immediately to the north, at the very edge of an agricultural field, is a cluster of 8 circular features (depressions?) each ca. 3 meters in diameter. 115 meters to the south is an isolated rectangular stone enclosure. 685680 E, 4174542 N.
- 255) Relict field systems marked by check dams. Fields follow the base of several small drainages.
- 256) Cellular stone foundations of an abandoned structure located on a wadi terrace. 688045 E, 4174301 N.
- 257) Karaköy. Dense modern village surrounded by an extensive complex of terraces and fields. 712710 E, 4173412 N.
- 258) Check dams in an abandoned field to the east of modern village 260. 702759 E, 4173181 N.
- 259) Five isolated sets of check dams marking relict field systems that follow the bases of small drainages.
- 260) Modern village surrounded by terraced and stone-fenced fields. 702169 E, 4173034 N.
- 261) Isolated stone foundation subdivided into four internal spaces. 687786 E, 4173203 N.
- 262) Faint traces of relict stone terraces and check dams.
- 263) Isolated ca. 12 X 8 meter stone foundation subdivided into three spaces and apparently constructed against a natural bedrock outcrop. Possibly an animal enclosure or a building. 693834 E, 4172484 N.
- 264) Check dams and terrace fragments marking relict fields in the bases of drainages, between the field systems surrounding Karaköy and Uzundere Köy. 711355 E, 4173146 N.
- 265) Modern village consisting of a few houses surrounded by a large number of open enclosures that are presumably animal corrals. Positioned in the base of a seasonal drainage. Agricultural fields outlined with stone fences to the east, and fields marked by check dams in the surrounding area. 696860 E, 4171953 N.
- 266) Sets of isolated check dams and terraces marking former fields in the base of drainages and on hillsides surrounding village 265. 696953 E, 4171741 N.

- 267) Set of isolated check dams to the northwest of campsites and abandoned farms 211, 212, 213. 688653 E, 4172213 N.
- 268) Dense cellular stone foundations of an abandoned village on a hilltop. Surrounded by agricultural fields marked by linear soil marks and check dams. 682134 E, 4171440 N.
- 269) Isolated set of check dams marking a relict field system.
- 270) Faint circular feature 8 meters in diameter that could mark the foundations of an abandoned structure. Surrounded by the traces of terraces that fall outside of the land currently cultivated around Akyar Köy. 715132 E, 4171239 N.
- 271) Uzundere Köy. Modern village surrounded by terraces and agricultural fields. 711085 E, 4171205 N.
- 272) Ruzgarlı Köy. Modern village surrounded by terraces and agricultural fields with stone fences and trees bordering them. 705407 E, 4170366 N.
- 273) Relict field systems marked by fragments of terraces and check dams. West of Ruzgarlı Köy. 704328 E, 4170926 N.
- 274) Koyunlu Köy. Dispersed modern village on a ridge top. Surrounded by fields marked by check dams. 684102 E, 4169929 N.
- 275) Isolated sets of check dams and relict terrace field systems between modern village 265, Aydınlı Köy (276), and Geçit Köy (221). 696895 E, 4169890 N.
- 276) Aydınlı Köy. Isolated set of check dams between Aksu Köy 228 and Uzundere Köy 271. 701714 E, 4169572 N.
- 277) Relict field systems marked by terraces northwest of abandoned village 280. 692592 E, 4169935 N.
- 278) Kömürcü Köy. Modern village in a northern extension of the Gercüş plain. 694664 E, 4168555 N.
- 279) Check dams surrounding modern village 278 and abandoned village 280. 695645 E, 4168785 N.
- 280) Cellular stone foundations of an abandoned village on a ridge above a wadi at the northern edge of the Gercüş plain. Directly west of and above Kömürcü Köy. 694104 E, 4168945 N.
- 281) Abandoned village labeled “Kışlak” on Google Earth. Small structures are arranged in a line following the edge of a ridge for over 650 kilometers. At least 5 isolated structures visible on the slope below the village. Some faint stone alignments hint at the presence of other structures or perhaps the remains of terraces or field boundaries. Agricultural fields in the wadi bottom below the site, extending to the west (284). 687711 E, 4169288 N.
- 282) Abandoned structure on a hilltop to the west of village 281. Cellular stone foundations. 687138 E, 4169531 N.
- 283) Rectangular stone enclosures in the wadi below abandoned village 281. Possibly a campsite, or the animal enclosures associated with that village, as the structures on the ridge above do not seem to include animal corrals. One cluster of 21 enclosures located on wadi terraces that seem to have been recently used given the state of their walls and dung discoloration. Several of these enclosures only have stone walls on two or three sides (typically the upslope side), suggesting that the other walls were constructed of perishable materials. A second more dispersed cluster of smaller enclosures is located in the drainage that extends to the south. This cluster consists of at least three less-well-preserved rectangular corrals and four more rounded/oval enclosures. 687349 E, 4169377 N.
- 284) Set of check dams marking a relict field system west of Kışlak (village 281). 686551 E, 4168685 N.
- 285) Isolated corral marked by dung discoloration; walls must have been constructed of perishable materials (walls may be visible....). 694367 E, 4172161 N.

- 286) Faint outlines of stone foundations of several structures, each approximately 12 X 12 meters. Located on a terrace adjacent to the Tigris. Campsite? 702657 E, 4178757 N.
- 287) Uninhabited, perhaps recently abandoned village on a hilltop overlooking slopes with terraces. 688814 E, 4173499 N.
- 288) Harman-tepe. Modern village. 677044 E, 4174640 N.
- 289) Evkuran. Modern village. 673238 E, 4169842 N.
- 290) Ucerli. Modern village. 671438 E, 4165419 N.
- 291) Sancaklı. Modern village. 677992 E, 4169374 N.
- 292) Armutalan. Modern village. 680311 E, 4167813 N.
- 293) Başağaç. Modern village. 677517 E, 4165432 N.
- 294) Yaylayanı. Modern village. 675958 E, 4163091 N.
- 295) Yayladüzü. Modern village. 688458 E, 4166471 N.
- 296) Ormancık. Modern village. 684526 E, 4163485 N.
- 297) Tokluca. Modern village. 679867 E, 4161644 N.
- 298) Baskavak. Modern village. 667065 E, 4159364 N.
- 299) Dereici. Modern village. 673188 E, 4157513 N.
- 300) Savur. Modern village. 666798 E, 4156267 N.
- 301) Akyürek. Modern village. 683901 E, 4163374 N.

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